

N A T U R A L

R E S O U R C E S



DRAFT

ENVIRONMENTAL
IMPACT
STATEMENT

on the

**POLICY FOR
SUSTAINABLE
FORESTS**

April 2005



WASHINGTON STATE DEPARTMENT OF
Natural Resources

Doug Sutherland - Commissioner of Public Lands

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WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Responsible Official

Kit Metlen, Division Manager
Asset Management and Protection Division

Contact Person

Dave Dietzman, EIS Project Manager
Asset Management and Protection Division



Doug Sutherland
Commissioner of Public Lands

April 2005

Dear Interested Parties:

The Washington State Department of Natural Resources is in the process of updating the 1992 *Forest Resource Plan*. The department began this process last spring with scoping the need, purpose, policy objectives and significant environmental issues that should be considered when updating the plan. A significant amount of oral and written comments were received. As a result of this scoping effort, the department is pleased to submit the attached *Draft Environmental Impact Statement on the Policy for Sustainable Forests*.

Within this Draft Environmental Impact Statement (EIS), 26 policy subject areas are analyzed and organized by four major policy categories: Economic Performance; Forest Ecosystem Health and Productivity; Social and Cultural Benefits; and Implementation. Key policy issues and decisions facing the Board of Natural Resources include: Old Growth; Public Access and Recreation; Forest Health; Wildlife Habitat; and Forest Land Planning.

This Draft EIS will provide environmental analysis to assist the Board of Natural Resources in their decision-making process and ultimate adoption of the *Policy for Sustainable Forests*. The policies contained in this document will guide long-term sustainable management of 2.1 million acres of forested state trust lands. As a result, the people of Washington can expect the continual flow of economic, ecological and social benefits well into the future, including revenue to support our public institutions, creation of wildlife habitat, clean air and water, as well as outdoor recreation.

Thank you for your interest in this *Draft Environmental Impact Statement on the Policy for Sustainable Forests*. A 30-day comment period begins with the publication of this document and the department invites you to attend and participate in the public hearings that are scheduled across the state the first two weeks of May. In addition, comments can also be made in writing through May 16, 2005. Your input is critical to this process and we look forward to receiving your thoughts.

Sincerely,

Doug Sutherland
Commissioner of Public Lands

Department of Natural Resources
1111 Washington ST SE
PO Box 47001
Olympia, Washington 98504-7001
(360) 902-1000





Fact Sheet

TITLE

Draft Environmental Impact Statement on the Policy for Sustainable Forests

DESCRIPTION

The proposal is the adoption of new policies to update the 1992 *Forest Resource Plan* for forested state trust lands managed by the Department of Natural Resources.

PROPONENT AND LEAD AGENCY

Department of Natural Resources

IMPLEMENTATION DATE

September 2005

RESPONSIBLE OFFICIAL

Kit Metlen, Division Manager
Asset Management and Protection Division

CONTACT

Department of Natural Resources
SEPA Center
PO Box 47015
Olympia, WA 98504-7015
Phone: (360) 902-2117, Fax: (360) 902-1789
E-mail: sepacenter@wadnr.gov
www.wa.dnr.gov/sepa

BOARD OF NATURAL RESOURCES MEMBERS

The Honorable Doug Sutherland,
Commissioner of Public Lands
The Honorable Christine Gregoire, Governor,
Represented by Bob Nichols, Senior Policy
Advisor, Salmon Recovery, Columbia River
The Honorable Terry Bergeson, State
Superintendent of Public Instruction
Dr. R. James Cook, Dean (Interim), College of
Agricultural, Human and Natural Resource
Sciences, Washington State University
Dr. Bruce Bare, Dean, College of Forest
Resources, University of Washington
The Honorable Ted W. Anderson,
Commissioner, Skagit County

PROJECT TEAM

Clay Sprague, Project Manager
Farra Arnold, Assistant Project Manager
Dave Dietzman, EIS Project Manager
Jodi Barnes, Administrative Assistant
Judith Holter, Budget Manager and Editor

EXECUTIVE STEERING GROUP

Bruce Mackey, Lands Steward
Bonnie Bunning, Executive Director for Policy
and Administration
Patty Henson, Communications Director
Craig Partridge, Policy Director
Jack Hulsey, Policy Advisor for Special
Strategic Assignments to the Commissioner
Vicki Christiansen, Region Operations Mgr.
Gretchen Nicholas, Division Manager
Art Tasker, Assistant Region Manager
Kathy Gerla, Senior Assistant Attorney General
Phil Ferester, Assistant Attorney General

DOCUMENT EDITING, PRODUCTION AND PRINTING

Executive Steering Group
Policy for Sustainable Forests Project Team
Jodi Barnes, Administrative Assistant
Nancy Charbonneau, Graphics Designer
Jane Chavey, Public Information Officer
Jenifer Gitchell, Natural Resource Program
Coordinator
Rochelle Goss, Secretary Supervisor
Gretchen Robinson, Editor

AUTHORS AND PRINCIPAL CONTRIBUTORS

Farra Arnold, External Relationships, DNR
Phil Aust, Financial Diversification &
Financial Assumptions, DNR
Janet Ballew, Acquiring & Granting Rights of
Way, DNR
Richard Bigley, Research, DNR
Angus Brodie, Older Forests & Old Growth,
DNR
Rex Crawford, Forest Health, DNR
Jeff DeBell, Genetic Resource, DNR

**AUTHORS AND PRINCIPAL
CONTRIBUTORS (CONTINUED)**

Florian Deisenhofer, Riparian Management
Zones, DNR
Dave Dietzman, SEPA Review, DNR
Kate Engel, Older Forests & Old Growth,
Parametrix Corporation
John Gamon, Special Ecological Features,
DNR
Michael Hall, Older Forests & Old Growth,
Parametrix Corporation
Andrew Hayes, Land Classifications, DNR
Pete Holmberg, General Silvicultural Strategy,
DNR
Sabra Hull, Wetlands, DNR
Simon Kihia, Implementation, Reporting &
Modification, DNR
Deborah Lindley, Wildlife Habitat, DNR
Doug McClelland, Visual Management, DNR
Steve Negri, Wildlife Habitat, Tetra-Tech FW,
Inc.
Gretchen Nicholas, Wildlife Habitat, DNR
Tami Riepe, Older Forests & Old Growth &
Wildlife Habitat, DNR
Karen Ripley, Forest Health, DNR
Jim Ryan, Watershed Systems, DNR
Mark Savage, Financial Diversification, DNR
George Shelton, Wildfire & Catastrophic Loss
Prevention, DNR
Pene Speaks, Public Access & Recreation,
DNR
Clay Sprague, Local Economic Vitality &
Forest Land Transactions, DNR
Lee Stilson, Cultural Resources, DNR
Joanne Wearley, Forest Land Planning, DNR
Dave Wolfer, Roads, DNR

DATE OF ISSUANCE OF DRAFT EIS

April 15, 2005

COMMENT PERIOD

The comment period for this Draft EIS is
April 15, 2005 through May 16, 2005.
Comments are due to the SEPA Center no later
than 5:00 PM on Monday, May 16, 2005:

Department of Natural Resources
SEPA Center
PO Box 47015
Olympia, WA 98504-7015
Fax: (360) 902-1789
E-mail: sepacenter@wadnr.gov

**PUBLIC HEARINGS TO BE
CONDUCTED**

May 3, 2005 – Lacey, Lacey Community
Center at Woodland Creek Community
Park
May 4, 2005 – Port Angeles, Peninsula
College
May 5, 2005 – Mount Vernon, Best Western
Cotton Tree Inn and Convention Center
May 9, 2005 – Longview, Cowlitz County
PUD
May 10, 2005 – Bellevue, Bellevue
Community College
May 11, 2005 – Ellensburg, Central
Washington University
May 12, 2005 – Spokane, Hilton Garden Inn

**LOCATION OF REFERENCED
MATERIALS**

See contact information.

**ANTICIPATED ISSUANCE OF FINAL
EIS**

August 2005

**ANTICIPATED BOARD OF NATURAL
RESOURCES ADOPTION OF THE
POLICY FOR SUSTAINABLE FORESTS**

September 2005

COST/AVAILABILITY

Copies of this Draft EIS are available at
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government planning departments (city and
county); affected Tribes; all state and federal
agencies with jurisdiction over selected
environmental organizations; academia;
Washington newspapers; libraries; and all
other interested parties.



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1. Executive Summary

1.1 State Environmental Policy Act Process Overview

1.1.1 Introduction

The Washington State Department of Natural Resources (the department) recognizes the importance of the State Environmental Policy Act (SEPA) to the process for writing the *Policy for Sustainable Forests*, formerly the *Forest Resource Plan*. The environmental impact statement (EIS) process provides opportunities for other agencies, stakeholders, the Tribes and the public to participate in developing and analyzing information. This process, as detailed in chapter 197-11 WAC, ensures that the Board of Natural Resources understands the environmental consequences of its decisions and considers mitigation of probable significant adverse environmental impacts when making these decisions.

The EIS process includes:

- Scoping;
- Preparing a draft EIS, which analyzes the probable impacts of a proposal and reasonable alternatives;
- Issuing a draft EIS for review and public comment;
- Preparing a final EIS, which includes analyzing and responding to comments received on the draft EIS;
- Issuing a final EIS; and
- Using a final EIS in decision-making.

1.1.2 Alternatives

The focus of a draft EIS is to analyze a range of reasonable alternatives, to assess their probable significant adverse environmental impacts and to identify mitigation measures to avoid or minimize adverse environmental impacts.

Alternatives are one of the basic building blocks of an EIS. They present meaningful options for the Board of Natural Resources' decisions. Policy changes being considered by the Board of Natural Resources are defined in the set of reasonable alternatives described in Chapter 3 of this Draft EIS. All of these alternatives represent different policy choices, which are consistent with the purpose and need for updating the *Forest Resource Plan*. The alternatives incorporate information gathered and issues raised through the SEPA scoping process.

This draft EIS includes a preliminary department staff-recommended alternative for the Board of Natural Resources to consider for each policy subject area. Each recommended alternative has been developed based on its ability to most fully meet the Policy Objectives (see Section 1.2.3), while avoiding or minimizing significant adverse environmental impacts. While most policy subject areas help achieve several policy objectives, none of the policy subject areas alone address all of the policy objectives. However, the alternatives were determined to meet the purpose and need of the *Policy for Sustainable Forests*. The primary policy objectives addressed by policy subject area are identified within each of the policy subject areas and alternatives discussions. Comments received from interested individuals and stakeholders during scoping were considered as the alternatives were developed.

1.1.3 Non-Project Proposal

The *Policy for Sustainable Forests* is a “non-project action” under SEPA. Non-project (also called programmatic) actions include the adoption of plans, policies, programs or regulations that contain standards controlling the use of the environment or standards that will guide future actions. Future site-specific management decisions on forested state trust lands will be guided by the policies developed during this process. The probable significant adverse environmental impacts analyzed in a non-project EIS are those impacts foreseeable at this stage, before specific project actions are planned.

1.1.4 Scoping

Scoping initiates public involvement in the SEPA process. It has three purposes: to narrow the focus of the EIS to significant environmental issues; to eliminate issues that would have insignificant impacts or that are not directly related to the proposal; and to help identify reasonable alternatives, consistent with the purpose and need of the proposed decision, to be analyzed in the EIS.

The scoping process alerts the public, the project proponent and the lead agency to areas of concern and potential controversy early in the process. Here, the department is both the project proponent and the lead agency.

The SEPA process for the *Forest Resource Plan* update was formally initiated with the scoping notice published on March 15, 2004. This was followed by a series of seven public workshops held between March 22 and April 1, 2004 in Mount Vernon, Seattle, Port Angeles, Longview, Lacey, Ellensburg and Spokane. The formal SEPA scoping period ended on May 17, 2004. Many interested individuals and stakeholders attended these public workshops and provided oral testimony. In addition to comments received at these public workshops, the department received written scoping comment letters and met with several key stakeholders.

1.1.5 Decisions to be Made

After this Draft EIS has been issued, the department will hold a series of seven public hearings in Lacey, Mount Vernon, Port Angeles, Longview, Bellevue, Ellensburg and Spokane. The public hearings are scheduled for May 3 through 11, 2005.

It is anticipated that many interested individuals and stakeholders will attend these public hearings and provide comments to the department on this Draft EIS. Those comments will be reviewed and responded to in the Final EIS, which is expected to be released in August 2005.

The Final EIS will provide necessary information that the Board of Natural Resources will use in deciding which policies will be adopted in the *Policy for Sustainable Forests*. Upon the Board of Natural Resources' approval of the *Policy for Sustainable Forests*, the department will have an updated set of working policies to guide its management of 2.1 million acres of forested state trust lands. The department will then update any other applicable department policies and procedures based on direction provided in the adopted policies.

1.2 Purpose and Need

1.2.1 Purpose

Consistent with the fiduciary standards governing trust management, the purpose of the *Policy for Sustainable Forests* is to conserve and enhance the natural systems and resources of forested state trust lands managed by the department to produce long-term, sustainable income, and environmental and other benefits for the people of Washington.

1.2.2 Need

A review and update of the 1992 *Forest Resource Plan* is needed to keep pace with the changes shaping current management of forested state trust lands. The *Forest Resource Plan* was envisioned to be a ten-year document. In 2002, the policies in the plan were extended by the Board of Natural Resources for an additional three years so the department could complete the Western Washington sustainable harvest calculation, which was identified as the first step to revising the *Forest Resource Plan*. The policies amended through the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* have already been analyzed and adopted by the Board of Natural Resources and will be included in the *Policy for Sustainable Forests* (see Appendix A). The development of the *Policy for Sustainable Forests* will position the department to effectively and sustainably manage forested state trust lands for the trust beneficiaries and the people of Washington.

1.2.3 Policy Objectives

The policy objectives for the *Policy for Sustainable Forests* are as follows:

1. Meet all federal and state laws, including the trust obligations and the contractual commitments of the *Habitat Conservation Plan*.
2. Balance trust income, environmental protection and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options.

-
3. Ensure policies are succinct, relevant and easily understood by the public and department employees.
 4. Seek productive partnerships that help the department achieve policy objectives.
 5. Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship.
 6. Pursue outcome-based management within a flexible framework.
 7. Promote active, innovative and sustainable stewardship on as much of the forested land base as possible.
 8. Identify trust lands that provide special ecological, social or cultural benefits that are incompatible with active management and look for opportunities to protect such areas through creative partnerships and funding mechanisms with appropriate compensation to the trusts.
 9. Capture existing and future economic opportunities for the beneficiaries from the forest land base by being prudent, innovative and creative.
 10. Monitor and periodically report to the Board of Natural Resources on the implementation and outcomes of Board of Natural Resources' approved policies.

1.3 Issues Identified Through Scoping

The comments received during scoping from the many interested individuals and stakeholders captured diverse issues, ideas and opinions. These comments and the department's responses were prepared in a summary (see Appendix G). These comments led to the development of policy alternatives which are addressed in the following four major policy categories and subsequent 26 policy subject areas:

Economic Performance

- Financial Diversification
- Financial Assumptions
- Land Classifications

Forest Ecosystem Health & Productivity

- Forest Health
- Wildfire and Catastrophic Loss Prevention
- Genetic Resource
- Special Ecological Features
- Older Forests and Old Growth
- Wildlife Habitat
- Watershed Systems
- Riparian Management Zones
- Wetlands

Social and Cultural Benefits

- Public Access and Recreation
- Cultural Resources
- Visual Management
- Local Economic Vitality

Implementation

- Forest Land Planning
- General Silvicultural Strategy
- Forest Land Transactions
- Roads
- Acquiring Rights of Way
- Granting Rights of Way
- Research
- External Relationships
- SEPA Review
- Implementation, Reporting and Modification

1.4 Summary of Proposal, Alternatives, Impacts and Mitigation Measures by Major Policy Category

Twenty-six policies are proposed for four major policy categories: Economic Performance; Forest Ecosystem Health and Productivity; Social and Cultural Benefits; and Implementation. These policies will ultimately make up the *Policy for Sustainable Forests*.

1.4.1 Economic Performance

Three policy subject areas make up the Economic Performance major policy category. These policy subject areas will provide direction to the department for decisions that directly affect the trust obligation of generating sustainable revenue from the management of forested state trust lands. The alternatives span levels of risk that the Board of Natural Resources is considering in pursuing new markets for forest and other products. They cover the frequency and approach to reviewing financial assumptions, as well as what trust lands are available or deferred from harvest. No probable adverse environmental impacts are identified for this set of policy alternatives. Environmental impacts related to setting an Eastern Washington sustainable harvest level will be considered at the time that the sustainable harvest calculation is undertaken.

1.4.2 Forest Ecosystem Health and Productivity

Nine policy subject areas make up the Forest Ecosystem Health and Productivity major policy category. These policy subject areas will provide direction to the department for management decisions that directly affect the health and productive capacity of forest ecosystems on forested state trust lands. The overall ecological condition of the forest asset directly impacts the economic, ecological and social values that these lands can provide. Each of the environmental elements covered in these policy subject areas is considered integral to the total health of the forest ecosystem. As such, the emphasis is placed on the need to provide landscape-scale mitigation measures over the life of these policies. The mitigation will draw upon the diversity of the forested state trust lands and the relationship between the physical and biological attributes represented in the landscape's ecoregions. This includes mitigation for probable significant adverse environmental impacts to wildlife, older forests and old growth, watersheds, wetlands, special ecological features and the inherent genetic diversity of the forest. Potential threats to the forested trust asset from insects and disease epidemics, wildfire and similar catastrophic events are also mitigated in the range of alternatives being considered, as well as compliance with state and federal law and the *Habitat Conservation Plan*.

1.4.3 Social and Cultural Benefits

Four policy subject areas make up the Social and Cultural Benefits major policy category. These policy subject areas will provide direction to the department for management decisions that directly affect social and cultural benefits derived from forested state trust lands. State law requires the provision for multiple use on forested state trust lands, when consistent with meeting trust obligations and producing sustainable revenue for each trust beneficiary over time. Scenic views are recognized as a substantial benefit to the people of Washington, as well as to visitors. Cultural resources are recognized as a substantial benefit to the state, helping people understand and appreciate the past history and current culture of Washington. In addition, it is understood that department programs can affect local economic vitality. The probable significant adverse environmental impacts and mitigation of impacts to both the natural and built environment are considered within a range of policy alternatives that meet state and federal law and trust objectives. Although significant adverse impacts to the natural environment are not identified from any of the alternatives, the potential risk for significant adverse impacts to public access and recreational opportunities may increase under some of the alternatives.

1.4.4 Implementation

Ten policy subjects make up the Implementation major policy category. These policy subject areas provide direction to the department for implementation of the *Policy for Sustainable Forests* objectives. There are policy alternatives for research; forest land planning; silviculture strategies; roads; land transactions; right of ways; external relationships; environmental review; and implementation, reporting and modification of the *Policy for Sustainable Forests*. These policies will provide a coordinated and comprehensive framework for implementation. Their emphasis is on ensuring efficiency in implementation and correction, when necessary, to achieve the policy objectives and outcomes described in the *Policy for Sustainable Forests*. They focus on landscape-scale approaches to analyze and mitigate potentially significant adverse environmental impacts and target landscape-scale enhancements of the forest asset. Cooperation and coordination with partners is emphasized to ensure stakeholder involvement in department plans and decisions. To mitigate any potential for significant adverse impacts from department activities, the alternatives being considered rely heavily on effective communication at all levels with affected government agencies, Tribes and the public.

1.5 Significant Issues and Environmental Choices Among the Alternatives

The 26 policy subject areas in this Draft EIS are analyzed individually, due to the importance of each of these topics, but they are not all independent of each other. As such, it is imperative to understand the relationships between key policies and the connections between the policy alternatives.

1.5.1 Key Relationships

Roads and Public Access & Recreation

The department relies on roads to access the forests for management activities. Potential adverse environmental impacts are minimized and/or mitigated by the construction techniques, placement and use restrictions on active roads, as well as the closure or removal of inactive roads. The interests of the trusts drive the department's decisions to minimize road miles and road use. The Public Access and Recreation policies direct public access and use of department roads and forested state trust lands. The Roads policy may limit public access and recreation in some areas under a policy objective to "minimize" the road network. The Public Access and Recreation policy may encourage more public access and recreation by aggressively seeking funding or other support through collaboration with others, that will accommodate current or increased public demand. The policy options compliment one another by focusing on the need to stay abreast of impacts resulting from all sources of use and emphasizing mitigation of those throughout the alternatives. Public funding can help mitigate the adverse impacts of public use on forest roads, as well as the adverse impacts to recreational opportunities that are likely to occur from more restrictions.

Financial Diversification, Public Access & Recreation and Roads

Diversification into greater public access and recreational opportunities on or adjacent to forested state trust lands would tend to shift environmental impacts from traditional timber harvest related activities, to those associated with increased public use and recreation. However, under the current range of alternatives analyzed for Public Access and Recreation, proposals to enhance public access and recreation are somewhat limited by the infrastructure needed to achieve trust objectives. In turn, any substantial diversification for producing sustainable revenue to the trust beneficiaries may change the management objectives for roads in the Roads policy subject area. The impact analysis for these types of major policy changes is considered speculative and dependent on yet undetermined potential future market shifts.

General Silvicultural Strategy and Other Policies

A key policy relationship exists between the General Silvicultural Strategy alternatives and several other proposed policies that are implemented through the department's Silviculture Program. The department's silvicultural strategies and treatments are the means for achieving multiple outcomes, e.g., revenue generation, wildlife habitat, forest health, riparian habitat and wildfire prevention. Although silvicultural treatments are prescribed on a site-by-site approach, outcomes are set through other policies and plans that consider the landscape-scale impacts and mitigation measures. Treatments are prescribed to guide the progression of stand development to achieve outcomes and enhance forest structural diversity across the landscape. The moderation of cataclysmic events, such as large wildfires, as a result of silvicultural treatments designed to meet a variety of landscape-scale outcomes is also expected to result in the perpetuation of relatively stable and viable ecosystems. The combination of the policy outcomes described in this Draft EIS and the use of silvicultural strategies to achieve them is

expected to substantially mitigate the risk of significant adverse impacts to the environment.

Forest Land Planning, Watershed Systems and Other Policies

Similar to the relationship between the General Silvicultural Strategy policy subject area and other policies, is the relationship between the Forest Land Planning policy subject area and other policies, including the defining of landscape-scale silvicultural strategies. Forest Land Planning is intended to provide a planning framework that ensures the accomplishment of policy outcomes. As such, the Forest Land Planning policy is procedural in nature. It does not contain substantive standards for the use or modification of the environment. However, the relationship between Forest Land Planning and the Watershed Systems policies is key to understanding the approach for considering cumulative impacts within watershed systems. The Watershed Systems alternatives are specifically designed to identify the cumulative impacts of department activities on watershed systems and provide mitigation when necessary. Linking this approach to Forest Land Planning provides the integration of cumulative impact analysis, required by SEPA, into landscape-scale planning. The flexibility to conduct planning at different scales to address unique circumstances provides additional mitigation to ensure a timely response to chronic or acute cumulative impacts within watershed systems.

1.5.2 Other Major Conclusions

The department's recommended policy alternatives for riparian and wetland protection analyzed in this Draft EIS are designed to fill a critical gap on lands in Eastern Washington. However, the effectiveness of the recommended policies will largely depend on the implementation procedures and guidelines.

Emphasizing landscape-scale objectives over site-specific and species-specific objectives lowers the potential risk of probable significant adverse environmental impacts to wildlife and their habitat on forested state trust lands.

Probable significant adverse visual impacts are primarily mitigated through compliance with other laws and policies, e.g., the general 100-acre harvest size limitation under the recommended alternative for Watershed Systems, leave tree requirements, riparian and wetland protection, forest land planning and SEPA analysis on both project and non-project proposals.

Probable significant adverse environmental impacts to the native tree gene pool on forested state trust lands are mitigated by a program that balances the protection of rare genes with careful management of seed supply. In addition, conservation lands, such as Natural Area Preserves and Natural Resources Conservation Areas, protect the native tree gene pool.

Probable significant adverse environmental impacts to special ecological features are mitigated by considering the contribution of special ecological features in meeting other trust obligations and providing a policy framework that allows for protection through a broader spectrum of strategies.

Probable significant adverse environmental impacts to cultural resources are mitigated by effective communication and promotion of collaboration with the Tribes and interested stakeholders.

Unavoidable Impacts

The probable significant adverse environmental impacts are evaluated and mitigation measures are discussed in this Draft EIS. Some mitigation measures result from the department staff-recommended policy alternatives. Implementation issues are addressed in the Implementation, Reporting and Modification policy subject area. Periodic updates to the Board of Natural Resources, coordinated reporting and the opportunity to review and modify policies when needed are intended to mitigate any probable significant adverse impacts that might occur due to new information or unforeseen circumstances.

1.6 Phased Review

SEPA review is required on proposals for project and non-project actions, such as the *Policy for Sustainable Forests*. The department will be proposing future project and non-project actions related to this *Policy for Sustainable Forests*. Those actions will range from planning to site-specific proposals for management activities, such as the development of recreational sites and timber sales.

Additionally, the department recognizes that other departmental policies and procedures will need to be reviewed as a result of the Board of Natural Resources' adoption of the *Policy for Sustainable Forests*. Once the Board of Natural Resources has adopted these policies, other implementation guidance will be reviewed and amended, created or cancelled where necessary. Procedures and policies that simply implement policies whose impacts are analyzed in this Draft EIS and don't establish new direction or standards resulting in impacts outside the scope of those evaluated in this Draft EIS, will not require a separate SEPA review. Where more specific management parameters are set that were not possible to anticipate at this broad policy level and where the impacts have not been analyzed, subsequent SEPA analysis will be conducted at that time.

The department is also specifically phasing the analysis of an Eastern Washington sustainable harvest calculation, which is anticipated to be completed within the next five years. The role, location and amount of older forests and old growth in Eastern Washington will also be analyzed as part of that process.

1.7 Alternatives Considered, But Not Analyzed

Under SEPA, a "reasonable alternative" is defined as "an action that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation. Reasonable alternatives may be those over which an agency with jurisdiction has authority to control impacts, either directly or indirectly through requirement of mitigation measures" (WAC 197-11-786). For some policy

subject areas, alternatives were considered, but not included in the detailed analysis, because they did not meet the purpose and need and, therefore, were determined not to be “reasonable.”

1.7.1 Unstable Slopes

This policy subject area was removed from the document after analysis showed that current management activities could continue by relying on existing state and federal law and the *Habitat Conservation Plan*, all of which anticipate management activities, such as roads and harvesting, on potentially unstable slopes with proper mitigation. Current management activities range from total avoidance to mitigated activities on potentially unstable slopes.

1.7.2 Wildfire and Catastrophic Loss Prevention

An alternative was considered that stated no policy was needed in the *Policy for Sustainable Forests* with relation to wildfire and catastrophic loss prevention. After further discussion, it was determined that there is a need for continued policy guidance for this policy subject area. Therefore, this alternative was not analyzed in this Draft EIS.

1.7.3 Other Alternatives, Comments and Suggestions

During the initial scoping process for the update of the *Forest Resource Plan*, many comments and suggestions were received from interested stakeholders and the public. The department examined these comments and included many elements of them in the policy subject area discussions and alternatives presented in this Draft EIS.

Other topics were evaluated and considered outside the scope of this proposal. Those topics included speculative costs in financial analysis, management of grazing on forested lands, contract compliance, employee/contractor training and safety, theft protection, biosolids, management in municipal watersheds and forest land conversions. Most of these topics apply to other areas of department planning and policy-setting or areas for which the department believes formal policy choices are not currently necessary.



2. Background

2.1 Introduction

The first chapter of this *Draft Environmental Impact Statement on the Policy for Sustainable Forests* describes the background and purpose of updating the *Forest Resource Plan* for forested state trust lands managed by the Washington State Department of Natural Resources (the department).

Included in this chapter are:

- The origin and purposes of trust lands in Washington State and the trust mandate;
- An overview of the department and the Board of Natural Resources; and
- The legal and regulatory framework of managing trust lands.

2.2 Washington's Trust Lands and Mandate

The department manages approximately 5 million acres of uplands and aquatic lands. Approximately 2.1 million acres are forested state trust lands, which are the subject of the *Policy for Sustainable Forests*. These lands are held in trust for the benefit of specific trust beneficiaries. The fiduciary aspect of trust management requires the department to manage these lands in a manner that produces long-term sustainable income for the beneficiaries. In doing so, the department complies with all state and federal laws and agreements. The department also complies with policies set by the Board of Natural Resources, the policy-making body for state trust lands.

The department manages primarily two categories of forested state trust lands: Federal Grant Lands and State Forest Lands. These lands have separate origins that are reflected in both the nature of the lands and how they are managed.

2.2.1 Federal Grant Lands

Just prior to Washington becoming a state in 1889, Congress passed the Omnibus Enabling Act of 1889 and granted more than 3 million acres of land to support various public institutions important for the new state. This act set aside two square miles of every 36 to produce financial support for the common schools. Also, the act granted

additional lands to other public institutions. These lands are known as Federal Grant Lands and consist of eight specific trusts:

- Common school lands, which support the construction of public schools;
- Agricultural school lands, which support the Washington State University in Pullman;
- Charitable, educational, penal and reformatory institutions lands, which support those public institutions;
- University original lands, which were used to support the University of Washington in Seattle (only a small amount of that acreage still remains);
- University transfer lands, which were originally part of the charitable, educational, penal and reformatory institutions lands trust, but were transferred by the state Legislature to provide additional support to the University of Washington;
- Normal school lands, which currently support four universities (Western Washington University in Bellingham; Central Washington University in Ellensburg; Eastern Washington University in Cheney; and The Evergreen State College in Olympia);
- Scientific school lands, which support the Washington State University in Pullman; and
- Capitol building lands, which support the construction of state office buildings on the Capitol Campus in Olympia.

Of the original Federal Grant Lands, approximately 1.463 million acres of forest lands remain and are the subject of the *Policy for Sustainable Forests*. Direction for management of these lands is specified in the Omnibus Enabling Act and the Washington State Constitution further limits and directs the sale, lease and management of Federal Grant Lands.

2.2.2 State Forest Lands

The department manages two categories of State Forest Lands: State Forest Transfer Lands and State Forest Purchase Lands. These were formerly known as State Forest Board Transfer Lands and State Forest Board Purchase Lands, respectively.

STATE FOREST TRANSFER LANDS

Most of the State Forest Lands are State Forest Transfer Lands. They total approximately 626,000 acres, or about 30 percent of the 2.1 million acres of forested state trust lands managed by the department.

State Forest Transfer Lands were acquired from 21 counties in the 1920s and 1930s through tax foreclosures. Later, pursuant to state law, most of these lands were transferred to the state of Washington. Many of these lands had been harvested. These lands were ultimately deeded to the state as State Forest Transfer Lands and placed in trust status. In exchange for the deed transfer, the county and junior taxing districts in

which the land is located are given a portion of the revenue from timber sales and other activities on these lands. In addition, a significant portion of the total revenue goes to support public schools, since the revenue is distributed based on local tax millage. The portion going to schools offsets State-General Fund support.

Because the state is both the grantor and trustee, the state has considerable flexibility to change the terms of the trusts through statutory direction. The Legislature has directed that the State Forest Transfer Lands be managed in the same way and for the same purposes as the Federal Granted Lands.

STATE FOREST PURCHASE LANDS

Nearly 80,000 acres of State Forest Lands are State Forest Purchase Lands. These lands were either purchased by the state or acquired as a gift by the state. The State Forest Purchase Lands were acquired under the 1923 Reforestation Act, which gave the State Forest Board the power to acquire any lands that were chiefly valuable for developing and growing timber and to designate these lands as State Forest Lands. All State Forest Purchase Lands were to be used primarily for forestry, forever reserved from sale. However, the timber could be sold and lands leased in the same way and for the same purposes as the State Federal Grant Lands.

COMMUNITY COLLEGE FOREST RESERVE

In addition to Federal Grant and State Forest Lands, the department also manages 3,223 acres of forest lands for community colleges. The Community College Forest Reserve was established by the state Legislature in 1990. Monies for the department to purchase the properties were appropriated that year.

These lands, located near urban areas, form a buffer between working forests and suburban uses. The properties are managed for sustained timber production, but special consideration is given to aesthetics, watershed protection and wildlife habitat. Revenues go in a special fund for building and capital improvements on community college campuses. These lands are also addressed by the *Policy for Sustainable Forests*.

KING COUNTY WATER POLLUTION CONTROL DIVISION

The department manages 4,336 acres as state forest land for the benefit of King County's Water Pollution Control Division. These lands were transferred to the department for management by an agreement made with King County in June 1995.

2.2.3 Trust Mandate and Responsibilities

A trust is a relationship in which one person, the trustee, holds title to property that must be kept or used for the benefit of another (Bogert, 1987). The relationship between the trustee and the beneficiary for these lands is a fiduciary relationship. A trust includes a grantor (the entity establishing the trust), a trustee (the entity holding the title), one or more beneficiaries (entities receiving the benefits from the assets) and trust assets (the property kept or used for the benefit of the beneficiaries). In the case of Washington's trust responsibility, the trust assets consist of the trust lands, funds in certain dedicated accounts and the permanent funds associated with certain trusts.

With the state as trustee, the Legislature has designated the department as manager of the Federal Grant Lands and State Forest Lands. The Board of Natural Resources is required by statute to establish policies to ensure sound management of trust lands.

In addition to complying with laws of general applicability, as a trust manager the department follows the common law duties of a trustee. These include, but are not limited to: administering the trust in accordance with the provisions that created it; maintaining undivided loyalty to each of the trusts and its beneficiaries; managing trust assets prudently; making the trust property productive, while recognizing the perpetual nature of the trusts; dealing impartially with beneficiaries; and reducing the risk of loss to the trusts.

The department must also comply with laws of general applicability. In 1984, the Washington State Supreme Court specifically addressed the state trust relationship in County of Skamania v. State of Washington, 102 Wn.2d 127, 685 P.2d 576. The Skamania decision explicitly addressed two of the trustee's duties. The Supreme Court found that a trustee must act with undivided loyalty to the trust beneficiaries to the exclusion of all other interests and to manage trust assets prudently. The court also cited a series of cases in which private trust principles were applied to land grant trusts. While all but one of these cases are from other states with differently worded enabling acts, they generally indicate that a state's duty is to strive to obtain the most substantial financial support possible from the trust property, while exercising ordinary prudence and taking necessary precautions for the preservation of the trust estate.

In the department's view, prudent management means, among other things, avoiding undue risk. The department believes it is in the best interest of the trust beneficiaries over the long-term to manage forested state trust lands to: prevent losses of ecological function, which may cause the listing of additional species as threatened or endangered; avoid circumstances likely to lead to public demand for ever-increasing, restrictive regulations of forest practices; and avoid the resulting contract disputes, uncertainty and loss of the ability to manage trust lands for their primary purpose.

That is why the department has in certain policies retained the freedom to exceed existing state Forest Practices Rules (Title 222 WAC) when necessary to protect resources on forested state trust lands.

In summary, any management action taken on Washington's state trust lands should be consistent with the principles of trust management. It is important to retain the long-term capacity of the forest, recognizing that near-term actions can create long-term economic, ecological and social benefits. The legal construction of Washington's trust lands create major differences in how these lands are managed when compared to other public lands and private fiduciary trusts.

2.3 Department of Natural Resources

2.3.1 The Department

The department was established in 1957 with the consolidation of several state agencies, boards and commissions to serve, in part, as the manager of state trust lands. In addition to forested state trust lands, the department manages agricultural and aquatic lands; natural areas and commercial real estate. It also administers several regulatory programs and acts as the state's principle wildfire control agency.

The department manages state trust lands primarily to provide substantial revenue to specific public beneficiaries to benefit the people of Washington. Such lands provide needed revenue to Washington's public schools, universities, prisons, state office buildings, hospitals, fire departments and other public services in many counties. Significantly, they also provide jobs, commodities, clean water, wildlife habitat and increasingly scarce recreational opportunities. The department manages trust lands to provide these additional benefits while maintaining the primary goal of trust revenue production.

As steward of these lands and natural resources, the department relies on a diverse staff of foresters, engineers, geologists, biologists, cartographers, hydrologists, soil scientists, economists and others who protect and manage lands for long-term productivity and revenue, as well as habitat and other conservation, education and recreation benefits.

2.3.2 Board of Natural Resources

As part of creating the department, the Legislature also created the Board of Natural Resources. Part of the Board of Natural Resources' charge is to approve major policies for state trust lands, including all forested state trust lands and resources for which the *Policy for Sustainable Forests* is being developed.

The Board of Natural Resources is comprised of six members: the Commissioner of Public Lands; the Governor (or a designated representative); the State Superintendent of Public Instruction; the Dean of the College of Agricultural, Human and Natural Resource Sciences, Washington State University; the Dean of the College of Forest Resources, University of Washington; and an elected representative from a county that contains State Forest Lands.

2.4 Legal and Regulatory Framework

The state and federal laws and rules referenced in this *Draft Environmental Impact Statement on the Policy for Sustainable Forests* are summarized in this section. The relationship of each law or rule to the department's policy decisions is explained within each policy subject area in Chapter 3.

In addition, the department entered into a legal/contractual obligation with the United States Fish and Wildlife Service and National Oceanic and Atmospheric Administration-

Fisheries when the *Habitat Conservation Plan* was adopted in 1997. This agreement applies to 1.6 million acres of forested state trust lands and is discussed further in the section on the Endangered Species Act.

2.4.1 State Laws

Washington state laws are categorized in the Revised Code of Washington (RCW). Corresponding state rules that provide more details about implementing the laws are categorized in the Washington Administrative Code (WAC).

PUBLIC LANDS ACT (TITLE 79 RCW)

The Public Lands Act is one of the laws by which the department manages all of its lands. The land management authorities and policies contained in it define both “multiple use” and “sustainable harvest,” which are key concepts applicable to the *Policy for Sustainable Forests*.

MULTIPLE USE CONCEPT (RCW 79.10.120)

The Legislature has directed the department to utilize a “multiple use concept” in the administration of public lands. The uses allowed under this concept must be in the best interests of the state and the general welfare of the citizens, as well as consistent with the trust provisions of the various lands involved.

Utilizing the multiple use concept means the department will manage trust lands to provide for other public uses when those uses are compatible with the obligations of trust management. Public uses that may be compatible with trust management activities include: recreational areas; recreational trails for both vehicular and non-vehicular uses; special educational or scientific studies; experimental programs managed by various public agencies; special events; hunting, fishing and other sports activities; maintenance of scenic areas; maintenance of historical sites; municipal or other public watershed protection; greenbelt areas; and public rights of way. If such additional uses are not compatible with the fiduciary obligations in the management of trust land, they may be permitted only if there is compensation to satisfy the trust’s financial obligations.

SUSTAINABLE HARVEST PROGRAM (RCW 79.10.300)

The department manages the forested state trust lands on a sustained yield basis. The department is required to periodically adjust the acreages designated for inclusion in the sustained yield management program and calculate a sustainable harvest level.

Sustainable harvest level is defined in the law as the volume of timber scheduled for sale from state-owned lands during a planning decade, as calculated by the department and approved by the Board of Natural Resources.

In September 2004, the Board of Natural Resources met the requirements of this law by adopting a revised sustainable harvest calculation.

FOREST PRACTICES ACT (TITLE 76.09 RCW)

The purpose of Washington's Forest Practices Act is to protect the state's public resources while maintaining a viable timber industry. The act regulates activities related to growing and harvesting timber on all non-federal forest lands in the state, including department-managed forested state trust lands. The Forest Practices Board was established and mandated to adopt the state Forest Practices Rules (Title 222 WAC) that govern how the Forest Practices Act must be implemented. Both the act and the rules have been amended over time to address evolving protection of public resources.

In 1999, the Washington Legislature authorized the Forest Practices Board to adopt new rules consistent with the *Forests and Fish Report*, an agreement that addressed protection of aquatic resources (RCW 76.09.055). In response, the Forest Practices Board amended the state Forest Practices Rules in July 2001. The objectives of the new rules are to further protect public resources by focusing on water quality, salmon habitat and other aquatic and riparian resources.

The department's Forest Practices Program administers and enforces the state Forest Practices Act and its rules. It operates independently of the department's state land management programs. Management activities on forested state trust lands are subject to the state Forest Practices Rules, as are forest management activities on non-federal public and private forest lands.

STATE ENVIRONMENTAL POLICY ACT (TITLE 43.21C RCW)

The State Environmental Policy Act (SEPA) requires state agencies to review proposed actions for probable significant adverse impacts and, when necessary, to prepare an environmental impact statement for actions that may have a probable, significant adverse impact on the environment. Compliance with SEPA ensures timely analysis, public comment processes and mitigation of the probable significant environmental impacts during various activities, including project planning and implementation, as well as during programmatic or policy-level planning efforts.

The SEPA Rules (chapter 197-11 WAC) provide more details for implementing this law. They also establish uniform environmental review requirements for all agencies.

Most department activities related to forest management, i.e., planning, road development, harvesting, silvicultural activities, etc., are subject to SEPA. Similar activities by private landowners are not subject to SEPA.

GROWTH MANAGEMENT ACT (TITLE 36.70A RCW)

The Growth Management Act requires local governments to establish comprehensive growth management plans that address a range of natural resource issues, including timber and other resources that may be on forested state trust lands.

The department works with local governments as they develop land use plans and regulations. In some cases, forested state trust lands that lie in zones identified for development will be converted to other uses or transferred out of trust status, with

compensation to the trust(s), when it best serves the trust(s) interests. In other cases, the department identifies forested state trust lands that should be protected from development when it is in the trust(s) best interests.

OTHER STATE LAWS

HYDRAULICS PROJECT APPROVAL (RCW 77.55.100)

Hydraulics Project Approval is required from the Washington State Department of Fish and Wildlife if proposed management activities on forested state trust lands would use or change the natural flow or bed of any state water.

SURFACE MINING ACT (TITLE 78.44 RCW)

The Surface Mining Act requires anyone who engages in surface mining activities, as defined by the act, to obtain a permit from the department. The law applies equally to any mining activities that may occur on forested state trust lands.

THE SHORELINES MANAGEMENT ACT (TITLE 90.58 RCW)

The Shorelines Management Act requires the Washington State Department of Ecology and local governments to manage shorelines by planning for and fostering all reasonable and appropriate uses. When the department conducts a management activity on forested state trust lands which falls within the purview of this law, the department must obtain a permit from the appropriate local government.

THE STATE WATER POLLUTION CONTROL ACT (TITLE 90.48 RCW)

The Water Pollution Control Act requires that the state of Washington maintain the highest possible standards to ensure the purity of all waters of the state, consistent with public health and public enjoyment; the propagation and protection of wildlife, birds, game, fish and other aquatic life; and the industrial development of the state. It also requires the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the state's waters.

2.4.2 Federal Laws

ENDANGERED SPECIES ACT (16 U.S.C. 1531 ET SEQ.)

The Endangered Species Act protects federally listed species and their ecosystems. Section 10 of the Endangered Species Act (16 U.S.C. 1539) authorizes a landowner to negotiate a habitat conservation plan with the United States Secretary of the Interior to minimize and mitigate any incidental impact to threatened and endangered species while conducting lawful activities such as forest practices. A habitat conservation plan may allow the landowner to develop habitat for endangered species at a landscape level, rather than protecting the individual sites at which the species is found on the landowner's property. As long as the landowner manages under the terms and conditions of the habitat conservation plan, the landowner will not be prosecuted for "take" of an individual animal. The permit issued to the landowner by the federal government is referred to as an

“Incidental Take Permit,” and identifies the range of activities allowed under each habitat conservation plan.

In 1997, the department and the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration-Fisheries (collectively referred to as “the Federal Services”) signed a multi-species *Habitat Conservation Plan* to address the department’s compliance with the federal Endangered Species Act in its management of forested state trust lands.

The department’s *Habitat Conservation Plan* covers approximately 1.6 million acres of forested state trust lands within the range of the northern spotted owl and is a multi-species land management plan that takes a landscape approach to managing for conservation of threatened and endangered species. The plan protects all currently listed and potentially listed species and manages for species populations, which in turn protects individual animals. Because many of the department’s forested state trust lands are adjacent to federal lands, the *Habitat Conservation Plan* is designed to supplement federal land management protection measures at a landscape level, as described in the *Northwest Forest Plan*.

THE FEDERAL WATER POLLUTION CONTROL ACT (CLEAN WATER ACT) (33 U.S.C. 1251 ET. SEQ.)

The Clean Water Act relates to protecting water quality. Washington’s Forest Practices Rules are constructed so that meeting the requirements of the rules also meets the requirements of state law, as well as this federal law.

2.4.3 Relationship to 2004 Sustainable Harvest Calculation

In 2004, the department recalculated the sustainable forest management harvest levels in Western Washington. The process included extensive public involvement, the services of the Sustainable Harvest Calculation Technical Review Committee and sophisticated computer simulations. It was supported by the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*. The computer simulations were used to understand how different policies may change forests over time and space. They also showed how forest ecology and forest revenues would change for the analyzed alternatives.

The policies amended through the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* that have already been analyzed and adopted by the Board of Natural Resources as part of that process will be included in the *Policy for Sustainable Forests* (see Appendix A).



3. Alternatives and Analysis

OVERVIEW

Chapter 3 contains a general discussion of the environmental setting of forested state trust lands across the state of Washington. Much of this discussion is focused on the ecological variability and diversity of Washington and, consequently, the forested state trust lands. This discussion is important because many elements of forested state trust land management are driven by the ecological setting, or ecoregion, where the lands are located. A general understanding of the ecoregions that contain forested state trust lands helps set the context for the alternatives contained in this Draft Environmental Impact Statement (EIS).

The remainder of Chapter 3 discusses 26 policy subject areas that are organized within four major policy categories: Economic Performance; Forest Ecosystem Health and Productivity; Social and Cultural Benefits; and Implementation. Each policy subject area has six subsections: Introduction; Affected Environment; Regulatory Framework; Alternatives; Significant Impacts and Mitigation Measures; and Cumulative Impacts. A preliminary department staff-recommended alternative has been identified for each policy subject area. The department staff-recommended alternative is the one that department staff feels best meets the Policy Objectives for the *Policy for Sustainable Forests* (see Chapter 1).

The following documents are incorporated by reference in this Draft EIS and are available for review on the department's website (www.dnr.wa.gov):

- *Final Environmental Impact Statement for the Forest Resource Plan* (Department of Natural Resources, 1992). This document discusses the environmental impacts of policies guiding the management of 2.1 million acres of forested state trust lands.
- *Forest Resource Plan* (Department of Natural Resources, 1992). This document consists of 40 policies guiding the management of 2.1 million acres of forested state trust lands.
- *Draft Environmental Impact Statement Habitat Conservation Plan* (Department of Natural Resources, 1996) and *Final Environmental Impact Statement Habitat Conservation Plan* (Department of Natural Resources, 1997). These documents discuss the potential environmental impacts of implementing conservation strategies to protect threatened and endangered species on forested state trust lands.

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- *Final Habitat Conservation Plan* (Department of Natural Resources, 1997). This document discusses the conservation of threatened and endangered species on forested state trust lands.
 - *Draft Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington and Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (Department of Natural Resources, 2004). These documents discuss the environmental impacts associated with the sustainable harvest level for Western Washington.
 - *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources* (Washington Forest Practices Board, 2001). This document discusses the environmental impacts of forest practices activities on aquatic and riparian habitat on private and forested state trust lands, as well as habitat protection for salmonid species which are listed as threatened or endangered under the Endangered Species Act.
 - *Final Environmental Impact Statement for the Proposed Forest Practices Rules and Regulations* (Washington Forest Practices Board, 1992). This document discusses state Forest Practices Rules and Regulations.

The following documents are also incorporated by reference in this Draft EIS:

- *Final Supplemental Environmental Impact Statement for the Northwest Forest Plan* (United States Department of Agriculture Forest Service and United States Department of the Interior Bureau of Land Management, 1994). This document discusses an integrated, comprehensive design for ecosystem management, intergovernmental and public collaboration, and rural community economic assistance for federal forests in Western Oregon, Washington and Northern California. For additional information about the *Northwest Forest Plan*, please contact the United States Department of Agriculture Forest Service's Public Affairs Office: Pacific Northwest Region, Public Affairs Office, P.O. Box 3623, Portland, OR 97208-3623, 503-808-2971, or at www.fs.fed.us/r6.
- *Economic Analysis as Prepared for: Washington State Department of Natural Resources* (Deloitte and Touche, LLP, 1996). This document provides information and analyses of land, natural resources, administrative and monetary assets managed by the Washington State Department of Natural Resources and the Washington State Investment Board. This document was prepared as part of the department's ongoing development of its *Asset Stewardship Plan*, which is intended to achieve the most substantial and sustainable benefits to current and future trust beneficiaries and the general public. This document can be reviewed at the department's headquarters in Olympia.

ECOREGION REPRESENTATION – ENVIRONMENTAL SETTING

The forested lands managed by the department are diverse. This diversity is shaped by the ecological variation across the state, ranging from low elevation temperate rainforests in Western Washington to open dry forests east of the Cascade Mountains. The physical attributes of the environment are responsible for the diversity of forest ecosystems that have developed in Washington. These ecosystems are products of the interactions over time between the physical attributes of the environment and the plant and animal species present within the environment. There are recognizable patterns to how individual ecosystem types are distributed across the landscape. Understanding the patterns that exist and the factors responsible for those patterns, especially disturbances, is critical to making wise management decisions regarding natural resources.

Ecoregions generally have a distinctive composition and pattern of plant and animal species. Abiotic factors, such as climate, landform, soil and hydrology are important in the development of ecosystems within ecoregions and help define them. Within an individual ecoregion, biotic factors, such as the ecological relationships between species and their physical environment, can be similar.

A description of each of the nine ecoregions represented in Washington is presented in Appendix B, which includes a discussion of the physical attributes of the ecoregions, a characterization of the dominant ecosystems present and the significant natural ecological processes operating within each ecoregion. This appendix is meant to provide an overview of the various biotic and abiotic factors that influence forest management decision-making and provide the environmental context for policy decisions in the *Policy for Sustainable Forests*.

3.1 Economic Performance

This major policy category contains policy subject areas related to revenue production and financial performance of forested state trust lands. These subjects address the range of activities and various commodities that should be considered in producing revenue from forested state trust lands. It also includes lands that are deferred from harvest activities. The policies in this major policy category, together with the other policies in this Draft Environmental Impact Statement (EIS), provide the broad context for the department's economic management of forested state trust lands and production of sustainable revenue for each trust beneficiary.

3.1.1 Financial Diversification

INTRODUCTION

Diversification is an important fiduciary consideration in meeting the department's obligations to each trust beneficiary. Financial diversification as a policy subject area deals with the forest asset class only and discusses both marketing and sales of forest products, as well as income from non-timber forest products and services. Financial diversification among trust asset classes, such as forestry, agriculture and commercial real estate is guided by the department's *Asset Stewardship Plan* and is not addressed in this Draft EIS.

The following Policy Objectives apply to this policy subject area:

- Pursue outcome-based management within a flexible framework (Policy Objective 6);
- Promote active, innovative and sustainable stewardship on as much of the forested land base as possible (Policy Objective 7); and
- Capture existing and future economic opportunities for the beneficiaries from the forest land base by being prudent, innovative and creative (Policy Objective 9).

AFFECTED ENVIRONMENT

Financial diversification actions do not change the overall timber harvest level from forested state trust lands. The overall level was determined by the Board of Natural Resources when making the sustainable harvest decisions in September 2004. Marketing different forest products and timing the sale of forest products can optimize financial returns for each trust beneficiary.

Special forest products provide revenue opportunities for the trust beneficiaries, as well as supporting a niche for a variety of local businesses. Special forest products can include western greens, Christmas greens and Christmas trees. The department issues permits and enters into leases for the harvest and sale of western greens to provide revenue to each trust beneficiary. Currently, there are approximately 330 western greens leases and

permits covering 128,000 acres, eight Christmas greens sales/leases involving a total of 8,100 acres, and seven leases to grow Christmas trees on forested state trust lands, covering less than 300 acres. Leases and permits for collection of western greens, Christmas greens and Christmas trees are categorically exempt from State Environmental Policy Act (SEPA) review. Actions or activities that are categorically exempt are those that would not significantly affect the environment.

No commercial harvesting of mushrooms is allowed on lands covered by the *Habitat Conservation Plan*. Recreational mushroom harvesting is allowed, but is limited to three gallons per person per day of a single species and a total of no more than nine gallons per person per day. Currently, compliance is not monitored and some unauthorized commercial-type harvest may be occurring on forested state trust lands.

Illegal harvesting and theft of special forest products can result in detrimental environmental impacts, such as entire removal or stripping of plants resulting in mortality or unauthorized removals and activity in riparian and wetland areas. The department's permitting and leasing program helps reduce illegal harvesting and minimizes associated environmental impacts.

The department leases forest land for a variety of other uses to supplement revenue for the affected trust(s). Such uses include communication sites, sand and gravel removals, recreation sites and energy generation. Site-specific environmental impacts associated with any such use is evaluated on a project-by-project basis. Potential revenue sources from non-extractive, low-intensity uses may exist, e.g., low-impact recreational use and carbon sequestration. The impacts on the environment of such uses will depend on the nature of the use.

REGULATORY FRAMEWORK

There are no regulations that apply to this policy subject area.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 reflects what the department recognized in 1992 as an increasing demand for special forest products and increased revenue opportunities. Maintaining Policy No. 8 commits the department to continue a special forest products program. Special forest products represent one element of financial diversification. Alternative 1 does not appear to meet Policy Objectives 6, 7 and 9 as well as other alternatives.

POLICY STATEMENT

Forest Resource Plan Policy No. 8, Special Forest Products: "The department will encourage and promote the sale of special forest products where appropriate and will market them in a manner consistent with the overall policies of this plan."

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 generally represents current financial diversification efforts within the forest asset class. Alternative 2 would direct the department to continue the current practice of offering a mix of forest products timed to take advantage of seasonal market fluctuations to improve revenue generation. The department would focus primarily on regional markets under Alternative 2. The department would continue to market non-timber-related commodities like special forest products when it would improve overall financial performance. The department would increasingly use contract harvesting as one method to improve financial performance through marketing and sales of forest products. The department would monitor changing land values and land use trends surrounding forested state trust lands to make informed forest land allocation and management decisions.

Alternative 2 would focus on diversification primarily within the forest products arena. Alternative 2 envisions using market indicators to guide the department in trust asset management and allocation by responding to market signals as they become apparent through land use patterns, changing land values and other market signals. While Alternative 2 represents a higher degree of innovation and creativity than Alternative 1, it fails to recognize the economic potential of ecological and social benefits that can flow from forested state trust lands. Alternative 2 appears to meet Policy Objective 6 better than Alternative 1, and doesn't appear to meet Policy Objectives 7 and 9 as well Alternative 4.

POLICY STATEMENTS

The department will identify and offer a mix of forest products to take advantage of existing markets and market value fluctuations.

The department will evaluate and capture financial opportunities through production, marketing and sales of both timber and non-timber-related commodities.

The department will continually evaluate land use patterns and changing land values to guide decisions about trust asset management and allocation.

■ ALTERNATIVE 3

DISCUSSION

Alternative 3 includes all of the components of Alternative 2. Additionally, the department would anticipate future demand for ecological and social benefits. The department would invest and seek to position trust assets to take advantage of that demand to benefit the trust beneficiaries. Although these benefits may not have immediate revenue potential, they would appear likely to have significant future revenue potential. These benefits have the potential to improve the overall financial performance

of forested state trust lands. Examples of future ecological and social benefits that have potential to increase in the future are recreation, tourism, water quantity and quality, forest certification and carbon sequestration.

Alternative 3 represents the highest degree of innovation, creativity and speculation by directing the department to anticipate or develop future economic markets for ecological and social benefits and position trust assets to take advantage of those markets.

Alternative 3 appears to meet Policy Objective 6, but doesn't appear to meet Policy Objectives 7 and 9 as well Alternative 4.

POLICY STATEMENTS

The department will identify and offer a mix of forest products to take advantage of existing markets and market value fluctuations.

The department will evaluate and capture financial opportunities through production, marketing and sales of both timber and non-timber-related commodities.

The department will continually evaluate land use patterns and changing land values to guide decisions about trust asset management and allocation.

Anticipating increased future demand, the department will actively pursue, evaluate and develop new economic opportunities related to the ecological and social benefits that flow from forested state trust lands.

■ ALTERNATIVE 4 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 4 includes all of the components of Alternative 2. Additionally, the department would expand its marketing efforts to national and international markets. The department would increase its efforts to capture additional revenue through leasing of forest land for other uses, such as energy generation and communication sites, when there is a clear opportunity to improve the net revenue from forest lands. The department would continue to evaluate different marketing and sales strategies beyond contract harvesting to improve overall financial performance of the forest lands. The department would participate in research related to economic and financial trends to identify partnerships and/or additional opportunities to improve financial performance through diversification. Alternative 4 recognizes that forested state trust lands offer unique products in the worldwide market, such as significant volumes of low elevation Douglas-fir. Alternative 4 provides for a higher degree of innovation and creativity by improving economic performance through diversification in the forest products arena. It also prudently seeks sources of income with immediate net revenue potential from forest lands related to non-forest products or ecological and social benefits, such as recreation and tourism. Alternative 4 best meets the applicable policy objectives by directing the department to actively manage the land base by seeking future economic opportunities,

while being prudent and innovative (Policy Objectives 7 and 9). In addition, Alternative 4 provides the department flexibility to seek new markets (Policy Objective 6).

POLICY STATEMENTS

The department will identify and offer a mix of forest products to take advantage of existing markets and market value fluctuations.

The department will evaluate and capture financial opportunities through production, marketing and sales of both timber and non-timber-related commodities.

The department will continually evaluate land use patterns and changing land values to guide decisions about trust asset management and allocation.

The department will actively expand its efforts to identify, develop and target new national and global markets for forest products.

The department will continually seek opportunities to creatively market and sell forest products to improve overall financial performance.

When there is a clear opportunity to improve the net revenue from forest lands, the department will actively pursue economic opportunities related to ecological and social benefits that flow from forested state trust lands.

The department will pursue additional forecasting services and research related to economic and financial trends to identify additional diversification opportunities.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

No significant adverse environmental impacts are identified for Alternative 1. Under Alternative 1, collection of western greens is a self-limiting process, because only part of the foliage of any plant meets commercial quality standards. Thus, harvesting practices result in retention of most of the plant and, consequently, a photosynthetic base for the regeneration of new foliage (Amaranthus and Pilz, 1996). For Alternative 1, no significant environmental damage has been observed as a result of the department's leases or permits to collect greens. The long-term ecological effects of western green collection are unknown, since this is a relatively new source of revenue. Other mitigation measures include no mechanical or motorized devices used in the harvest of special forest products, except for using helicopters to remove boughs from the forest. All special forest products are harvested by hand. All permits, sales and leases have limitations and guidelines to provide environmental protection and ensure compliance with the *Habitat Conservation Plan*.

Alternative 2 envisions a more active approach for identifying and responding to market opportunities for both timber and non-timber products. In identifying and offering a mix of forest products, the department does not anticipate increasing the overall level of timber harvest. Therefore, it is not anticipated that there will be any significant impacts associated with these actions. Alternative 2 envisions using market indicators, including changing land use patterns and land use values, to guide the department's decisions

related to trust asset management and allocation. None of these responses to market shifts are anticipated to have a significant impact on the environment.

Alternative 3 puts more emphasis on anticipating increased future demand relative to the ecological and social benefits that flow from forested state trust lands. Promoting more intense or new uses of forested state trust lands to produce revenue could have either negative or positive impacts on the environment, depending on the type, location and intensity of use. For example, if ecological services or other conservation values can be effectively marketed, that may result in management actions with less environmental effects than traditional uses. Environmental impact analysis of new uses or marketing of new commodities from forested state trust lands in the future would be analyzed as appropriate or required at that time. Therefore, there are no significant adverse environmental impacts identified for Alternative 3.

Under Alternative 4, refining markets for timber products nationally and globally is not expected to increase the timber harvest level as set by the sustainable harvest calculation, or otherwise impact the environment. Alternative 4 envisions a more active effort by the department to market existing timber products, not increase the level of timber harvest. The level of harvest for special forest products could increase as new markets are identified, developed and targeted. It is unknown to what extent demand will increase for special forest products. Therefore, it would be speculative to identify any adverse environmental impacts associated with an increased level of harvest of special forest products.

Alternative 4 envisions a more active response to market and non-market signals to capture additional economic returns. The potential impacts from Alternative 4 on the natural and built environments will depend on the opportunities that become available and are pursued and thus, the impacts are unknown at this time. The environmental impacts of new uses or marketing of new commodities from forested state trust lands in the future would be analyzed as appropriate or required at that time.

CUMULATIVE IMPACTS

The likelihood of any cumulative impacts from these alternatives is purely speculative for products other than timber, since it will depend on responding to new markets that are currently unknown.

For the sale and marketing of timber, none of the alternatives are expected to increase the harvest level as set by the Western Washington sustainable harvest calculation, as analyzed in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*. Any changes to the Eastern Washington sustainable harvest level as a result of a new Eastern Washington sustainable harvest calculation will be analyzed under a SEPA phased review.

3.1.2 Financial Assumptions

INTRODUCTION

Forest investments are based on various financial assumptions. Assumptions about prices, costs, interest rates and other financial factors reflect national and regional economic conditions, as well as anticipated changes in forest product markets. The department makes certain assumptions as it uses various investment models to guide decisions related to silvicultural investments; capital investments, such as roads; forest land investments; and other investment decisions. The nature and timeliness of reviews and updates of financial assumptions are critical to making sound investment decisions on behalf of each trust beneficiary.

The following Policy Objective applies to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2).

AFFECTED ENVIRONMENT

The financial assumptions and the department's investment analysis programs help the department allocate scarce financial resources to achieve the optimum economic results. The amount of trust money available for investment into the previously identified activities varies due to the interaction of several macro-economic and micro-economic factors. Gross and net revenues are determined by market dynamics and operating costs. If there is sufficient investment revenue in the Resource Management Cost Account and/or Forest Development Cost Account, capital is allocated using the previously referenced models.

REGULATORY FRAMEWORK

There are no regulations that apply to this policy subject area.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 directs the department to review its financial assumptions each year. Economic situations may change more or less frequently than every year. Adjustments to financial assumptions driven by general economic trends may be more effective than annual adjustments. Alternative 1 does not appear to meet Policy Objective 2 as well as the other alternatives.

POLICY STATEMENT

Forest Resource Plan Policy No. 12, Annual Review of Financial Assumptions: “The department will review and adjust annually its financial assumptions used in management decisions.”

■ ALTERNATIVE 2

DISCUSSION

Under Alternative 2, the department would track financial trends and periodically adjust its financial assumptions when general economic situations dictate, rather than simply every year. Review and adjustment would be driven by economic trends, not by a set period of time. Alternative 2 places the emphasis for adjustments of financial assumptions on general economic trends. Alternative 2 appears to better meet Policy Objective 2 than Alternative 1.

POLICY STATEMENT

The department will review financial assumptions on a periodic basis and make adjustments when general economic situations dictate.

■ ALTERNATIVE 3 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 3 includes all of the components of Alternative 2. Additionally, the department would develop and utilize a state uplands coordinated approach for reviewing and adjusting financial assumptions to be used for analyzing investment decisions related to managing forested state trust lands. Alternative 3 would provide better consistency within the department related to investment analysis and financial assumptions. Alternative 3 best meets the applicable policy objective by providing a more prudent approach to reviewing and updating the financial assumptions and providing more consistency between upland programs (Policy Objective 2).

POLICY STATEMENTS

The department will review financial assumptions on a periodic basis and make adjustments when general economic situations dictate.

The department will utilize a comprehensive approach to periodically review and update the financial assumptions used in forest management decisions.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Financial assumptions can influence the level of capital investment and management decisions that may modify the environment. At this time, it is indeterminate if the selection of an alternative method will result in more capital investment or management decisions that have a positive or negative impact on the natural environment.

CUMULATIVE IMPACTS

The analysis of cumulative impacts is purely speculative for these policy alternatives, since it cannot be determined with any certainty how a change in financial assumptions under the selection of the alternatives might affect management decisions. For Western Washington, all management decisions and proposals related to timber harvest levels will be within those already analyzed in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* and the *Habitat Conservation Plan*. For Eastern Washington, a SEPA phased review will be completed to analyze any change in the current sustainable harvest level pursuant to the implementation of Policy No. PO14-A Circumstances Triggering the Need for a Recalculation of the Sustainable Harvest Level, which was adopted by the Board of Natural Resources in September 2004 (see Appendix A).

3.1.3 Land Classifications

INTRODUCTION

Historically, the department has classified forested state trust lands into two general categories: “on-base” and “off-base.” This was done, in part, to comply with RCW 79.10.320. On-base lands were those forested state trust lands considered capable of producing timber revenue. Such lands were included in the department’s timber harvest plans. Off-base lands were trust lands that typically could not produce another timber crop within 80 years of harvest. Properties where harvesting had been deferred due to the potential risk to public resources were also considered off-base lands. Forest land that was deemed too small, isolated, difficult to access or removed from the harvest base to meet some other specific need or objective was included in the off-base category. Historically, off-base lands were not included in a sustainable harvest calculation. The determination of on-base and off-base status is subject to change as new information becomes available. The 2004 sustainable harvest calculation for Western Washington classified lands according to management objectives, such as riparian and wetlands, general management objectives and special management emphasis. As a result, some lands that were traditionally considered off-base for purposes of timber harvest were now included in the sustainable harvest calculation, because they met other objectives even though timber harvest was not intended.

The following Policy Objective applies to this policy subject area:

- Ensure policies are succinct, relevant and easily understood by the public and department employees (Policy Objective 3).

AFFECTED ENVIRONMENT

This policy subject area deals with classification or designation of lands that are deferred from harvest for a specified period of time. Harvest deferrals can be short or long-term in duration. If the objective for deferred lands changes in the future, those lands may become available for harvest. For example, in addition to commitments made in the *Habitat Conservation Plan*, the department agreed with the Federal Services to protect a number of northern spotted owl habitat circles until 2007. Therefore, those lands are deferred from harvest for the agreement’s duration. After the expiration of the agreement, such lands may be available for harvest, but like the other lands, are subject to existing forest management objectives and constraints.

Forested state trust lands not considered for commercial timber management at the current time include, but are not restricted to, those for which timber harvest is operationally or economically infeasible; those that pose an unduly high risk to public resources; mature natural stands in the Olympic Experimental State Forest, 15,000 acres; old growth research areas, 2,000 acres; gene pool reserves, 2,400 acres; habitat areas having a crucial interim role in a species’ persistence (for example, northern spotted owl circles or marbled murrelet reclassified habitat); and lands having special ecological features or local issues that warrant short or long-term deferral from harvest.

A determination of the acreages designated for inclusion is made each time the sustainable harvest level is calculated. The most recent calculation set the harvest level for Western Washington in September 2004. A full description of that calculation is contained in both the *Draft EIS on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* and in the *Final EIS on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*.

The land classification scheme for the 2004 calculation was discussed in great detail throughout the SEPA documents. A summary of on- and off-base lands for each of the alternatives considered can be found in the *Final EIS on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* Table 2.6-4 (Chapter 2, pages 2-34). There are currently 516,000 of 1.39 million acres (37 percent) in an off-base or deferred from harvest status in Western Washington forested state trust lands. By 2013, off-base or deferred from harvest lands will decrease to 232,000 acres (17 percent) as a result of the release of lands previously deferred. The 1.39 million acres does not include 139,000 acres removed from the calculation for Western Washington, as they were determined to be non-forested lands, such as roads and waterways.

A sustainable harvest calculation for Eastern Washington has not been recently completed. Therefore, an updated inventory of lands deferred from harvest for the statewide total of 2.1 million acres of forested state trust land is not currently available. The department will be performing an Eastern Washington sustainable harvest calculation within the next five years.

REGULATORY FRAMEWORK

The sole regulatory framework for the classification of forested state trust lands exists for the purposes of the calculation of the sustainable harvest level. Identifying lands for inclusion in the sustainable harvest calculation is central to projecting a sustained yield of timber. The Public Lands Act (chapter 79.01 RCW) defines land management authorities and policies and the need and legislative mandate for the sale of timber on a sustained yield basis. Specifically, RCW 79.10.320 states, “The department shall manage the state-owned lands under its jurisdiction which are primarily valuable for the purpose of growing forest crops on a sustained yield basis insofar as compatible with other regulatory directives. To this end, the department shall periodically adjust the acreages designated for inclusion and calculate a sustainable harvest level.” Identifying lands that are available, and therefore those that are unavailable, for harvest at any given point in time is necessary to comply with this statute. However, even those lands which are not “primarily valuable for the purpose of growing forest crops” serve important habitat and other roles. Therefore, such lands are a critical consideration in calculating a sustainable harvest level.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 continues designating forested state trust lands as either “on-base” or “off-base” for the purposes of identifying forest lands capable of producing merchantable timber within 80 years for harvesting and for determining what lands are included in the sustainable harvest calculation. However, this is no longer consistent with how the department classifies lands for the sustainable harvest calculation. Alternative 1 does not appear to meet Policy Objective 3 as well as Alternative 2.

POLICY STATEMENT

***Forest Resource Plan Policy No. 3, Land Classifications:* “The department intends to designate those lands and timber resources that are unavailable for harvest as “off-base.” All deferrals will be included in this category.”**

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 recognizes that forested state trust lands are managed to meet multiple economic, ecological or social objectives and are set by state and federal law, including the *Habitat Conservation Plan* and Board of Natural Resources policy. Many of these objectives have evolved since adoption of the *Forest Resource Plan*. All forested state trust lands contribute or have the potential to contribute to one or more of the various objectives. Through the sustainable harvest calculation process, the capability of forest lands and associated forest stands to meet these objectives is analyzed. The department assigns silvicultural regimes for stands at the broad landscape level to examine the outcome of implementing policy objectives over space and time.

The majority of forested state trust lands in Western Washington have been included in the 2004 Western Washington sustainable harvest calculation to determine their role in meeting Board of Natural Resources objectives. It is anticipated that a similar approach will be used during the upcoming Eastern Washington sustainable harvest calculation.

Some forested state trust lands may play an important role in meeting ecological objectives in their current condition. They will likely be unavailable for harvest during the next decade or longer. These lands are classified as deferrals in the sustainable harvest calculation and, while not currently available for harvest, are included in the calculation. For example, old growth research areas help meet older forest targets for *Habitat Conservation Plan* planning units, but are not available for harvest. Other examples of lands in this category are recreation sites and gene pool reserves. Alternative 2 best meets the applicable policy objective by providing more clarity for both the public

and department employees with regard to the designation of lands available for harvest (Policy Objective 3).

POLICY STATEMENT

The department will designate those lands and timber resources that are unavailable for harvest as short or long-term deferrals.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

There are no significant adverse impacts as a result of these policy alternatives. The difference between Alternative 1 and Alternative 2 is only in nomenclature. Under Alternative 1, lands are moved in and out of off-base designation with changes in deferral status. On-base lands include all lands that are available for harvest, while off-base lands include lands not available for harvest.

Alternative 2 removes the “on-base” and “off-base” terminology, which provided an oversimplified policy framework for today’s forest management environment, as demonstrated in the 2004 sustainable harvest calculation completed for Western Washington forested state trust lands. Alternative 2 distinguishes between lands available at any point in time for harvest and those not available. All of these lands, however, are included in the harvest calculation, allowing the department to determine the role of all forested state trust lands in meeting economic, ecological or social objectives.

There are no significant probable adverse environmental impacts associated with this change to the Land Classifications policy subject area. Per legislative direction (RCW 79.10.320), the department will determine lands available for harvest at any given time for the purposes of calculating the sustainable harvest level. Whether lands are deferred or available for harvest will be assessed independently of whether the language in Alternative 1 or Alternative 2 is adopted by the Board of Natural Resources. Therefore, there are no anticipated environmental impacts from either of the alternatives.

CUMULATIVE IMPACTS

There are no cumulative impacts related to these policy alternatives.

3.2 Forest Ecosystem Health and Productivity

This major policy category contains policy subject areas related to elements of the forest ecosystem that are important to ecological objectives and long-term health and productivity of trust assets. These subject areas provide the broad context for the department's management and maintenance of the ecological health of forested state trust lands to ensure long-term, sustainable, healthy forest ecosystems and consequently, a sustainable flow of economic and social benefits for each trust beneficiary and the people of Washington.

3.2.1 Forest Health

INTRODUCTION

A functioning, healthy forest ecosystem has many components, one of which is the forest stand itself. In addition to maintaining other key elements of the forest ecosystem, maintaining healthy stand conditions keeps the forest productive. What constitutes a healthy forest varies by geography, by watershed, climatic zone, etc. Ecoregions, their associated plant communities and natural vegetative series are the basis for identifying appropriate species and stocking levels at the stand level (see Appendix B). Productive, healthy forests directly provide many economic, ecological and social benefits to each trust beneficiary and to the people of Washington. The department utilizes a number of silvicultural activities, including prescribed fire and tree removal, to keep forests healthy and resistant to insects, disease and catastrophic fire. Two major components of maintaining forest health are prevention of damage by maintaining appropriate stand level species composition/age and stocking levels; and monitoring and treatment of insects, disease, noxious weeds, animal damage and other similar threats to trust assets, when their impacts are excessive.

The following Policy Objectives apply to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2);
- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4);
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5); and
- Promote active, innovative and sustainable stewardship on as much of the forested land base as possible (Policy Objective 7).

AFFECTED ENVIRONMENT

“Forests are defined as healthy if they have sufficient resiliency to respond to and recover from encountered stress while maintaining their capacity to provide necessary ecological process support and generate desired levels of amenities and products” (National Association of State Foresters Forest Health Committee Charter, April 1992). Forest health is a condition of forest ecosystems that sustains appropriate ecological complexity, while providing for human needs. A healthy forest maintains its unique species and processes, while maintaining its basic structure, composition and function. In addition, it has the ability to accommodate current and future needs of people for values, products and services. Forest entomology and forest pathology, the studies of forest insects and forest diseases, focus on forest health. These disciplines stress prevention of insect and disease problems through early detection and management activities that maintain appropriate species and structure, enhance tree vigor and discriminate against damage-causing organisms. Species composition and the stocking levels of those species are the primary elements of the affected environment that indicate the health of the forest in terms of resistance and resilience to the influences of insects and disease. The relationship between forest fire and forest health is discussed in the Wildfire and Catastrophic Loss Prevention policy subject area in this document. Also, incorporated by reference is the discussion on this subject in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (pages 4-25 to 4-29).

Insects and diseases also affect tree vigor and forest structure by slowing tree growth, causing trees to differentiate in size and shape; creating snags and dead wood, creating forest openings; and consuming seeds or stunting seedlings. They provide food for fish and wildlife, prey on and parasitize other insects, pollinate flowering plants, aid roots in acquiring water and nutrients and decompose dead material. The presence of insects and disease-causing organisms are part of healthy forests.

Ecoregions reflect broad ecological patterns occurring across a landscape due to significant differences in major physical features, such as climate and soil. Ecoregions generally have distinctive patterns of plant and animal species relationships, composition and interacting ecological processes, such as fire regimes and periodic drought. Within an individual ecoregion, forest composition, age, and annual and long-term weather conditions influence the presence, abundance and effect of forest insects and disease on trees and, consequently, overall forest health.

At this time, forest insects are a more significant disturbance factor in Eastern Washington forests than in Western Washington Forests (see Maps 1 and 2). For example, the dry spring climate in Eastern Washington is more conducive to defoliating insect survival. Seasonal drought stress reduces a tree’s capacity to produce pitch and increases tree vulnerability to bark beetles. Conversely, root disease causing fungi and foliage disease organisms are more prevalent in Western Washington, because moisture regimes are suitable for fungal growth and spore reproduction. Under appropriate environmental conditions, such as ice storm damage, multi-layered host crowns, or off-site plantings, insect and disease populations can rise rapidly. These circumstances create

epidemic conditions that kill trees, damage tree form, slow tree growth and contribute to fire risk. In general, forest insects can cause severe damage to just one species or size range of trees, while forest diseases can affect host trees of all sizes.

Forest composition and structure in many Washington ecoregions (Puget Trough, East Cascades, Okanogan, Blue Mountains, North Cascades, Columbia Plateau and Canadian Rocky Mountains) is significantly influenced by both natural and human-caused fire. Relationships between fire and tree species and size combinations, and the insects and fungi that feed on them have evolved over time. Dry, low-elevation forests burned more frequently and extensively prior to the mid-20th century than they do now. Late 20th century fire reduction was due to grazing and successful wildfire suppression efforts. As a result of lack of fire and prevalent harvesting practices, forest composition has shifted toward higher tree densities, often smaller trees, and domination by shade-tolerant conifers or less fire-resistant trees. The result is high fuel amounts and connectivity. The abnormally high tree and fuel densities create a forest health problem, because the composition and structure is particularly vulnerable to damage from defoliating insects, bark beetles, dwarf mistletoe, root disease, drought and severe fire. Wetter, less accessible high-elevation forests that naturally burned fairly infrequently, have not been as dramatically affected by successful fire suppression or harvesting, although they are now more likely to burn severely as the interval since prior fires increases, stands mature and fuel levels build across the landscape.

The 2004 Aerial Insect and Disease Damage Detection Survey (see Table 1) indicated that many areas of Eastern Washington are currently affected by bark beetles (western pine beetle, mountain pine beetle, Douglas-fir beetle, fir engraver beetle and spruce beetle), the western spruce budworm, and balsam woolly Adelgid (an exotic, aphid-like sucking insect). Disease organisms are less well-identified by an aerial survey than insect activity, but Swiss needle cast is observable and is affecting coastal Douglas-fir plantations. The “bear damage” symptom, widely identified throughout the state when dead trees are scattered, may actually be caused by or associated with root disease fungi in many cases. Root disease fungi are very persistent on a site and can continuously affect many generations of host trees. The exotic disease white pine blister rust has severely reduced the presence and viability of western white pine in many locations and is severely diminishing whitebark pine populations across the state.

Table 1: Percent of Washington Forested Lands Affected by Elevated Levels of Disturbance Agents by Major Landowner (Based on 2004 Aerial Survey)								
	Federal	Percent Affected	Private	Percent Affected	Tribal	Percent Affected	State	Percent Affected
Percent of Forested Land	43.6	NA	39	NA	5.8	NA	10.4	NA
Amount of Acres (in millions)	9.541	NA	8.541	NA	1.269	NA	2.27	NA
Douglas-fir Beetle	26,532	0.278	12,092	0.142	6,686	0.527	5,098	0.225
Fir Engraver Beetle	146,642	1.537	77,392	0.906	57,744	4.55	31,349	1.381
Pine Bark Beetle	235,157	2.465	56,229	0.658	112,887	8.896	28,280	1.246
Bear/Root Disease	23,093	0.242	83,679	0.98	11,036	0.87	26,982	1.189
Western Spruce Budworm	169,224	1.774	8,458	0.099	6,559	0.517	8,950	0.394
1. Mortality affecting over 1 percent of an ownership is notable, but should be given further consideration based on the location of the land and management objectives of the landowner. 2. Aerial survey identifies areas with elevated levels of mortality. Not every tree on an affected acre is dead.								

Noxious, invasive plant species impact plant communities and ecosystem functions. In the worst case, uncontrolled invasive weeds may replace native plants that eventually lead to altered plant communities, habitat functions and overall biodiversity. Ecosystem functions that can change with exotics species invasions are hydrology, soil chemistry, fire behavior and the overall value of natural resources. Species that have the ability to become dominant may be toxic, poisonous or parasitic and may reduce forest productivity. Currently, 42 percent of the plant and animal species listed by the Federal Services as threatened or endangered have been negatively affected by invasive species. The expansion of invasive, noxious plant populations is costly, and results in loss of production and added expenditures for eradication, control and habitat restoration.

Noxious weeds, both native and non-native, typically are species adapted to disturbed site conditions. They are often tolerant of soils low in organic matter, nutrients and moisture levels. These conditions and subsequent invasions are often the result of forest management activities, such as: 1) equipment used to thin or harvest trees that disturbs the soil by churning up the surface layer and compacting the soil; 2) equipment, vehicles,

people and animal movement that transport seeds from one location to an area not yet infested; 3) disturbance activities in areas that retain seeds or roots in the soil from an older invasion; and 4) fire that removes organic material from the surface layer of the soil, exposing the soil and reducing moisture and nutrient levels.

In general, the spread of noxious weeds tends to increase in response to activities that disturb soil and native plants. The rate and success of spread often depends on different types and durations of disturbance and persistence of the species at a site. The more invasive species, once established, can spread from disturbed sites into undisturbed sites. Noxious weeds may out-compete native species and become dominant or under some situations, become a monoculture. Many noxious weeds are prodigious seed producers capable of producing up to 50,000 seeds or more per plant. Seeds may persist in the soil anywhere from a few years, to 35 years or more. Other invasive species spread aggressively through extensive and rapid root growth and can persist under dense canopies only to re-emerge following forest disturbance.

The Columbia Plateau, Okanogan and Puget Trough ecoregions have the greatest concentration of noxious weeds. All of the remaining ecoregions have noxious weed issues, particularly at lower elevations and riparian areas. In general, noxious weed concerns for forested state trust land management are more numerous in drier forests in both Eastern and Western Washington, particularly those associated with livestock operations, recreational activity and roads.

The most effective prevention strategy for noxious weed control is to prevent them from ever being introduced and established. Preventive measures typically are the most cost-effective means to minimize or eliminate environmental and economic impacts. Short of prevention, early detection and rapid response is a critical component of any effective noxious weed management program. Prompt and coordinated containment and eradication of new noxious weed species can reduce environmental and economic impacts. Early detection of new infestations requires regular monitoring. Established noxious weeds require a control strategy to minimize their effects and limit their spread. Effective control relies on understanding the target species' biology, the ecosystem infested and effective control tools. Monitoring of control requires persistent follow-through. Control of some infestations may require site restoration with native species and monitoring.

Timber harvest can have various impacts on forest health. For example, tree removal and thinning affect the size and species of trees on a site, their density/growing space and relative vigor. Tree removal prescriptions can be written to achieve many objectives, such as to correct stand conditions that are recognized as being high risk for insect or disease activities. The suite of insects and diseases that affect a mature stand changes in a regenerating stand to pests of small trees with thin bark and foliage in the high humidity region near the ground. Contrarily, some root disease fungi affect large and small host trees equally.

Stand and tree response varies depending on species characteristics, but if partial tree removal favors taking smaller, less vigorous, diseased trees, then average size and vigor

will rise and the relinquished growing space will be available for the residual trees. If tree removal is delayed, stand growth may slow and stagnate and, over time, stand composition will shift toward more shade-tolerant species. Mature stands with multiple layers of host foliage are susceptible to defoliating caterpillars and dwarf mistletoe. If harvest favors taking the largest individual trees, then forest structure and composition shifts to smaller, less vigorous and more shade tolerant species. Tree removal can selectively deplete a given host species, increasing stand vigor if that species is susceptible to disease, but reducing stand vigor if the disease hosts become more prevalent.

Tree planting allows rapid reforestation with fast growing seedlings, selected to thrive on a site and achieve objectives. Although natural regeneration does occur, it is not an effective treatment for root disease and, depending on the sizes of openings and seed sources, may shift species composition away from the desired species. Planted seedlings can be susceptible to drought, insect damage and frost, because they have a small root system, are attractive to some insects, may be injured by the storage and transplanting process, and may not be placed in the most ideal microhabitat.

Tree wounding allows decomposer organisms to access woody tissue. It causes decay that lowers wood strength and density and can contribute to tree breakage. Wounds can result in high quality habitat trees for cavity nesting wildlife.

Pruning removes the lower branches of trees and contributes to the formation of clear-grained exterior wood. It can contribute to insect or disease problems when the pruning causes large wounds that allow entry of decay organisms or attract wood-boring insects. Pruning can reduce fuel ladders and increase the resistance of white pine trees to white pine blister rust disease.

An integrated strategy to implement silvicultural activities in order to mimic the forest density, species composition and stand architecture once maintained by natural disturbance regimes can successfully address the forest health consequences of past harvesting practices and fire suppression success. Direct treatment of forest pests is an effective way to reduce the pest populations and suppress insect or disease activity until susceptible stand conditions or favorable environmental conditions change.

REGULATORY FRAMEWORK

The basic constraints on pesticides and their use are described by federal law. The Federal Insecticide, Fungicide and Rodenticide Act governs the licensing or “registration” of pesticide products. The Federal Food, Drug and Cosmetic Act governs pesticide residue levels in food or feed crops.

The Washington State Department of Agriculture performs a number of activities, including registering pesticide products in the state, investigating complaints of possible misuse, maintaining a registry of pesticide sensitive individuals and administering a waste pesticide collection program. These duties are performed under the authority of the Washington Pesticide Control Act (chapter 15.58 RCW), the Washington Pesticide Application Act (chapter 17.21 RCW), the General Pesticide Rules (chapter 16-228 WAC), the Worker Protection Standard (chapter 16-233 WAC) and a number of pesticide

and/or county specific regulations. The Washington State Department of Agriculture also regulates the management of weeds (chapters 17.04-17.10 RCW) and plant pests (chapter 17.24 RCW and chapter 15.08 RCW).

Forest management activities, including special activities such as pesticide applications to suppress insect or disease, are regulated by the state Forest Practices Rules (chapter 222-38 WAC) in order to protect public resources. In addition, the department is required to implement Integrated pest management practices (chapter 17.15 WAC) when carrying out duties related to pest control. Moreover, forest insects and diseases are regulated by chapter 76.06 RCW (forest insect and disease control) which describes insects and diseases that threaten permanent timber production as a public nuisance. It requires that owners of timber lands make every reasonable effort to control, destroy and eradicate such forest insect pests and forest tree diseases that threaten the existence of any stand of timber.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 is designed to limit unacceptable damage to trust assets. Under Alternative 1, excessive levels of insects, diseases and other significant threats to trust assets from other sources, such as noxious weeds and animal damage, will be controlled through the appropriate management activities. While Alternative 1 allows the application of longer-term solutions to forest health problems, such as addressing inappropriate species composition and/or stocking levels, it doesn't emphasize it. Alternative 1 does not appear to meet Policy Objectives 2, 4, 5 and 7 as well as Alternative 2.

POLICY STATEMENT

Forest Resource Plan Policy No. 9, Forest Health: “The department will incorporate forest health practices into the management of state forest land to bring about a net benefit through the reduction or prevention of significant forest resource losses from insects, diseases, animals and other similar threats to trust assets.”

■ ALTERNATIVE 2 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 2 includes all of the components of Alternative 1 and builds on them by emphasizing development of long-term landscape strategies to monitor and address the fundamental causes of forest health problems. Alternative 2 also encourages the department to work closely with the scientific community, other agencies and other landowners as new approaches to forest health issues are developed. Alternative 2 encourages active management on as much of the land base as possible to prevent significant forest health problems. Alternative 2 best meets the applicable policy

objectives by balancing trust income, environmental protection and other social benefits (Policy Objective 2). In addition, Alternative 2 encourages partnership opportunities to promote forest health (Policy Objective 4), as well as encourages professional judgment, best available science and sound field forestry for department employees (Policy Objective 5). Lastly, Alternative 2 promotes innovation and sound stewardship (Policy Objective 7).

Alternative 2 would increase the emphasis on addressing overstocking and inappropriate species composition. This is of particular importance in the dry forests of Eastern Washington where fire suppression and past harvesting practices have contributed to stands that are highly susceptible to forest insects, disease and fire due to overstocked stands consisting of late-successional, relatively shade tolerant conifers (Douglas-fir and grand fir).

POLICY STATEMENTS

The department's priority is the development of landscape strategies at an appropriate scale to address the forest health issues of overstocking and/or inappropriate species composition. Using vegetative series, the goal is to adjust stand composition and density to favor species best adapted to the site.

The department will also incorporate cost-effective forest health practices into the management of forested state trust lands to reduce or prevent significant forest resource losses from insects, diseases, animals, noxious weeds and other similar threats to trust assets.

The department will work closely with the scientific community, other agencies and other landowners to incorporate new effective forest health approaches.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

As stated in the Affected Environment subsection of this policy subject area, the primary significant threats to healthy functioning forests and the forest resource trust assets are lack of resistance and resilience to the influences of insects and disease. This potential threat is directly related to stand-level species composition and stocking levels, thus making these two factors the primary evaluation criteria for this policy subject area.

Although animal damage and noxious weed species are considered potential threats to a healthy functioning forest ecosystem and can also pose threats to trust assets, these are not identified as significant threats to a healthy functioning forest ecosystem on forested state trust lands. However, both of the alternatives recognize and address the need to respond to impacts from sources other than insects and diseases.

Under Alternative 1, until recently, forest health improvement efforts have been focused on site-by-site and stand-by-stand treatments, when infestations or outbreaks have occurred. These efforts have also been directed by short-term economic considerations and have tended to ignore the long-term economic and ecological consequences of not treating the underlying causes of forest health issues. Because of this, there is a higher risk of long-term adverse impacts to the natural elements of the environment that make

up healthy, functioning ecosystems, i.e., water, earth (erosion), plants and animals, including wildlife habitat and the built environment, that may include aesthetics, recreation and risk of landscape-scale wildfire.

Under Alternative 1, there have been recent efforts to design strategies to control stocking levels and species composition across broad landscapes over the long-term. The recently adopted sustainable harvest calculation employs silvicultural strategies to treat dense stands to improve overall vigor and health of Western Washington forests. Recent efforts in Eastern Washington also include development of landscape strategies to treat species composition and overstocking to improve forest health.

However, lack of emphasis on broader strategies to treat species composition and overstocking in Alternative 1 makes it incomplete and ineffective in dealing with forest health issues on forested state trust lands, with greater ecological consequences for the long-term than in Alternative 2.

Under Alternative 1, the department will continue to control the spread of noxious weeds. These efforts will reduce impacts to the integrity of native plant communities and healthy functioning ecosystems, such as those related to hydrology, soil chemistry, fire behavior, habitat and overall diversity. The department employs mitigation measures of an integrated pest management program described in further detail under the General Silvicultural Strategy policy subject area in this Draft EIS to minimize impacts of controlling noxious weeds.

There are no significant adverse impacts identified for Alternative 2. Although timber harvesting may increase in some areas, the purpose of the harvests is to improve the health of the forest ecosystem and the elements of the environment listed under Alternative 1. The specific adverse impacts that could be related to any activities that implement this policy will be analyzed under the State Environmental Policy Act (SEPA), as plans and projects are proposed within specific geographic locations. Additional emphasis on restoring stands to dominance of early seral species composition (pine, Douglas-fir and larch) under Alternative 2 will have significant long-term benefits, including improving forest resistance and resilience to forest pests and reducing catastrophic wildfires and the future need for direct suppression. As more stands are treated over time, the landscape will begin to reflect more historic conditions where frequent low and moderately severe fire events lowered fuel loads and reduced tree density, creating sustainable, fire-resistant stands.

As forest management activities are increased in eastside forests, adverse environmental impacts will be mitigated by adherence to road-building standards and riparian protections. As tree biomass is reduced and more snowfall accumulates on the ground, additional water may be available. The resulting stands will be more in balance with the water and light resources available on the site and may provide more understory diversity, such as grasses and shrubby vegetation. There will be a reduction of susceptibility to severe disturbances related to uncharacteristically severe wildfire and damaging insect outbreaks associated with overcrowded stands. The potential for

undesirable effects to soils and non-target wildlife caused by direct suppression of fire or insects and diseases will also be reduced.

Under Alternative 2, short-term impacts on some sites to habitat quality for specific wildlife may increase when stand components are removed, such as broken, decayed or diseased trees, or dense canopy cover of a vulnerable species. The preservation of some of this stand component and its future replacement with a less susceptible or less contagious component can be evaluated and targeted in the development of the future stand. Under Alternative 2, forest insects and diseases will not be eliminated, but the intensity, extent and duration of outbreaks are likely to be reduced.

Under Alternative 2, the department will continue to control the spread of noxious weeds and treat excessive animal damage. These efforts will reduce impacts to the integrity of native plant communities and healthy functioning ecosystems, such as those related to hydrology, soil chemistry, fire behavior, habitat and overall diversity.

It is anticipated that Alternative 2 will be more likely to restore productive forest stands, protect future management options, protect public resources and prevent undesirable damage than will Alternative 1.

CUMULATIVE IMPACTS

The likelihood of cumulative adverse impacts to the natural and built environment is greater under Alternative 1. This is due to the greater emphasis on a site-by-site approach that responds to major insect and disease outbreaks. Under Alternative 2, the increased susceptibility of larger landscapes to cumulative adverse impacts related to major insect and disease outbreaks can be mitigated by landscape-scale strategies to reduce overstocking of stands and promote species compositions reflective of historical stands.

Any cumulative adverse impacts that could result from increased harvest levels will be mitigated by adherence to the state Forest Practices Rules and other subject areas in this Draft EIS, e.g., Riparian Management Zones, Wildlife Habitat and Watershed Systems.

Any cumulative adverse impacts that could result from treatments of insect and disease outbreaks, animal damage or noxious weeds will be mitigated by the department's Integrated Pest Management practices that are discussed under the General Silvicultural Strategy policy subject area in this Draft EIS.

3.2.2 Wildfire and Catastrophic Loss Prevention

INTRODUCTION

One of the department's primary fiduciary responsibilities is the protection of trust assets from loss due to catastrophic wildfire or other factors, such as wind, insects and disease. Prevention of wildfire helps protect the economic, ecological and social features of forested state trust lands and assures progress toward meeting trust objectives. Wildfire and other catastrophic loss prevention involves identifying, planning and implementing prevention efforts, sometimes with adjacent landowners, to minimize impacts. It also involves fuel reduction on forested state trust lands. Overall, healthier forests are less likely to experience catastrophic losses.

The following Policy Objectives apply to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2);
- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4); and
- Capture existing and future economic opportunities for the beneficiaries from the forest land base by being prudent, innovative and creative (Policy Objective 9).

AFFECTED ENVIRONMENT

Since statehood, land management practices and wildfire exclusion have changed the composition of forest stands in Washington State. This is especially true in Eastern Washington. Much of the forests of Western Washington and in higher elevations and montane portions of Northeastern Washington tend to experience infrequent, high severity fires. Consequently, the historic condition of most forests in the Eastern Washington Cascade mountain range, the northern Rocky Mountains and the Puget lowlands were maintained by frequent low and moderately severe fire events. The later fire regime tends to maintain stands with lower fuel loads and reduced stem densities, as well as create a sustainable, fire-resistant stand. The results of frequent low and moderately severe fires creates a mosaic of forest types, fuel loading and habitats across the landscape.

Today, fire exclusion and other past management practices in areas that formerly supported low and moderately severe fires have created stands with heavy fuel loading and high stand densities across entire landscapes. Stands in this condition are difficult to sustain over time, because they are overstocked, often with shade-tolerant tree species that are vulnerable to forest pests and disease. The stress from overstocking affects all tree species. This stress, combined with increased fuel loading, puts entire landscapes at higher risk of large stand-replacement fires.

Fire events are part of the natural environment and forest succession in the Pacific Northwest. Many plant species need fire to propagate. Fire reduces competition among species and promotes the creation of snags and down woody debris for wildlife. However, the environmental impacts of large stand-replacement fires can be catastrophic, particularly where low and moderately severe fire regimes have been altered.

The effect of fire on the environment is highly variable and complex. It can provide new habitat, rejuvenate some species, eliminate habitat and diminish other species. The organic layer of litter and other organic material that has accumulated over decades on the forest floor is reduced or removed, depending on fire intensity. Fire effects on erosion are related to the destruction of ground cover and soil organic material. The loss of groundcover exposes mineral soil that is subject to overland flow and raindrop impact. The removal of this cover may change site productivity; affect water retention, movement and percolation; contribute to mass wasting, soil erosion and local flooding; and limit reforestation efforts.

Air emissions increase as thousands of tons of organic material are consumed rapidly and particulate matter is carried over hundreds of miles. Local communities and adjacent valleys are often burdened with particulate matter far above acceptable health levels for days and weeks.

Watershed hydrology includes the amount, intensity and timing of water movement. The impacts of a large wildfire could have significant impacts on forest hydrology. The timing and volume of surface runoff is changed, contributing to peak flows that can adversely impact public safety and infrastructure. Although percolation is reduced, groundwater is not as sensitive to changes in the forest environment as surface water and is much more dependent on local geology.

Large, severe fires alter whole plant communities and successional regimes for decades or centuries. However, many plant species require fire as part of their life cycle, while other plants are adapted to vigorously resprout or to invade and establish in open, nutrient-rich growing environments following a fire.

The immediate impacts of large stand-replacement fires are abrupt and severe. Specific habitats, niche micro- and macro-environments, are often lost from a landscape for decades or longer. Critical habitat for some threatened and endangered species is lost; cover, forage and prey for wildlife is altered. Wildlife may be killed directly by the heat and smoke of fires and, at the landscape level, some wildlife populations may subsequently die from lack of food, water or habitat loss. The loss of key organisms, such as pollinators and decomposers, can significantly affect the recovery of a forest ecosystem. Tremendous quantities of carbon that have been sequestered in the forest are consumed by fire and redistributed to the atmosphere. However, in the months and years following a large wildfire, the changing composition of groundcover vegetation can provide an alternate or superior food source for other animals and insects. Fire effects on vegetation cover alter the distribution of wildlife populations across the landscape.

Compared to historic stocking levels, much of the land the department manages, particularly in Eastern Washington, is overstocked. However, at a landscape level,

variable stand density, including higher-stocked stands, have always been present and are part of the forest integrity. Overstocking may provide habitat structure for some threatened and endangered species, while eliminating habitat for others.

Overstocked stands greatly influence wildland fire behavior and effects by contributing to the quantity, arrangement and size of fuels. On a local scale, the fuels directly in front of an ongoing fire affect fire behavior. More importantly, long-term landscape level spatial fuel problems indicate persistent and potential catastrophic fire problems. Long-range weather predictions indicate that fuel moistures may reach historic lows if prevailing climatic trends continue for the next 20 to 30 years.

Current drought conditions are contributing to the pandemic insect infestations found in many forest ecosystems in Eastern Washington. Insects kill the stressed trees, drying and accumulating large amounts of fuel, thus making the forests easily susceptible to extreme wildfire.

Lastly, human population growth in the state of Washington has resulted in thousands of homes in the wildland/urban interface, adjacent to or within forested state trust lands. Privately developed property complicates fire suppression efforts and influences forest management alternatives that would reduce stocking levels and fuel loading. In addition, increasing public use on forested state trust lands increases the risk of fire starts.

REGULATORY FRAMEWORK

Forest insects and diseases are regulated by chapter 76.06 RCW (forest and disease control), which describes insects and diseases that threaten permanent timber production as a public nuisance. It requires that owners of timber lands make every reasonable effort to control, destroy and eradicate such forest insect pests and forest tree diseases that threaten the existence of any stand of timber. The regulatory provisions of this law are currently being reviewed by the Legislature.

Fire hazards on forest land are regulated by RCW 76.04.060. This law states the owner of land and the person responsible for the existence of an additional fire hazard shall take reasonable measures to reduce the danger of fire spreading from the area and may abate the hazard by controlled burning or other satisfactory means.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 directs the department to initiate supplemental protection measures to reduce losses from wildfire when the costs of these practices are less than the cost of leaving the resources at risk. Alternative 1 does not support active management as well as Alternative 2. Alternative 1 does not appear to meet Policy Objectives 2, 4 and 9 as well as Alternative 2.

POLICY STATEMENT

Forest Resource Plan Policy No. 10, Fire Protection: “The department will supplement the state's fire protection program to bring about a net benefit through the reduction of significant resource losses from wildfire on department-managed land.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 more clearly links department efforts to maintain healthy forests, with the added benefit of preventing catastrophic wildfire loss through fuel reduction. It also reinforces the dual benefits of such strategies to each trust beneficiary and all the people of Washington. In addition, Alternative 2 states that salvage of timber damaged through catastrophic events is important. Alternative 2 best meets the applicable policy objectives by balancing trust income, environmental protection and other social benefits (Policy Objective 2). In addition, Alternative 2 encourages partnership opportunities to reduce the risk of forest resource loss (Policy Objective 4), and provides for capturing economic opportunities through salvage (Policy Objective 9).

POLICY STATEMENTS

The department will incorporate wildfire and other catastrophic loss prevention strategies, including development of fire-resistant stands, into its management of forested state trust lands. Forest stands that have been materially damaged by fire, wind, insects or diseases will be salvaged when such actions are in the best economic and ecological interests of each trust beneficiary. The objective is to reduce or prevent significant forest resource losses to each trust beneficiary and to all the people of Washington.

The department will coordinate with local, state and federal fire prevention programs; the scientific community; other agencies; and other landowners to reduce the risk of forest resource loss from catastrophic events.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Alternative 1 directs the department to continue its aggressive fire suppression activities on both state and private land. Department managers are directed to consider supplemental protection measures during planning efforts to minimize the impacts on forested state trust lands and promote the increased use of wood residue. These actions are largely focused on small scale projects and emerging opportunities.

Over the last decade, long-term drought, subsequent forest health impacts to fuel loading and increased populations in rural areas have contributed to the unprecedented large catastrophic wildfires that are increasing in frequency during fire seasons. These events have shown the department that land managers need to be much more aggressive in dealing with factors contributing to landscape-wide fuel loading and overstocking in state forests to prevent or lessen the incident of catastrophic wildfire. Failure to take aggressive

active management to treat overstocked stands and associated fuel loading will continue the trend of large catastrophic stand-replacement fires at a landscape level, particularly in Eastern Washington.

Under Alternative 1, there is an increased risk of catastrophic fires. This results in increased risks of short-term impacts of deteriorated air quality and multi-year impacts to watershed hydrology and overland flows, as well as increasing the risks to human life and improved property. Alternative 1 also increases the risk of long-term adverse impacts to whole plant communities and critical wildlife habitat. With no focus on developing fire-resistant stands, Alternative 1 severely hampers the department's efforts to recover and restore listed threatened and endangered species and to act on initiatives related to non-listed species. In addition, the department's efforts to protect special ecological features, including Natural Area Preserves and Natural Resources Conservation Areas, will be at risk.

There are no significant adverse impacts identified from Alternative 2. Alternative 2 is focused on active stand management to reduce fuel loading at the landscape level. This is expected to result in sustainable forests with a substantially reduced risk of catastrophic stand-replacement wildfire, while at the same time retaining the long-term integrity of the forest environment. Management efforts will be focused on forested state trust lands that historically have had a mixed severity of fire with a frequency of 35 to 100 years. This fire regime should primarily exist in dry grand fir, Douglas-fir and Ponderosa pine forests.

Department managers will incorporate fuel management considerations into landscape strategies to meet an array of structural conditions across the landscape. The department will continue to implement prevention efforts with adjacent landowners to minimize wildfire impacts on forested state trust lands and on neighboring lands. The department will also continue to work with various groups, both public and private, to promote increased utilization of wood residue to reduce fuel loading.

Wildfires that may occur under Alternative 2 in this environment would have much shorter impacts on air quality, because of the reduced size and intensity. Impacts to watershed hydrology and over land flows would be largely confined to drainages, instead of landscapes. Impacts to plant communities and critical wildlife habitat would be at a more historic and sustainable level, providing a mosaic of diversity across the landscape that would aid the department's initiatives related to non-listed species.

Short-term impacts to water quality are likely to result from the salvage of timber that has been damaged by wildfire. Structure that will be needed to meet future habitat objectives and facilitate prompt reforestation will be identified and protected during salvage activities. Salvage operations will also be mitigated by state Forest Practices Rules and other policy subject areas in this Draft EIS.

CUMULATIVE IMPACTS

Alternative 1 continues to address forest health issues through small-scale projects and a reactive approach. This will lead to continued forest health impacts associated with

overstocked stands and landscape-wide fuel loading on state and other lands. This, in turn, is expected to result in a continuation of large catastrophic wildfires at the landscape level across all ownerships. This will increase the risk of impacts to soils, wildlife habitat and special ecological features, and pose additional risk to human life and improved property. In addition, implementing landscape objectives using the vegetative series should enable adjacent landowners to implement similar cost-effective prevention efforts.

There are no significant cumulative adverse impacts identified for Alternative 2. The potential for cumulative adverse impacts under Alternative 2 from management activities that encourage the development of fire-resistant stands over time will be mitigated by state Forest Practices Rules and other policy subject areas in this Draft EIS, e.g., Wildfire and Catastrophic Loss Prevention, Riparian Management Zones, Wetlands and General Silvicultural Strategy.

3.2.3 Genetic Resource

INTRODUCTION

The genetic makeup of tree populations is a key factor affecting forest health and productivity. For this policy subject area, the genetic makeup of native tree populations will be referred to as the “gene pool.” The department recognizes the importance of maintaining and protecting this genetic resource. As a result, the department considers the native gene pool to be one of the trusts’ assets worthy of protection. The gene pool is protected both by carefully managing the reforestation seed supply and by maintaining a system of gene pool reserves. These reserves are deferred from harvest to ensure that native genetic material, well-adapted to local conditions, will be available to the department in the future.

The following Policy Objective applies to this policy subject area:

- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5).

AFFECTED ENVIRONMENT

The primary element of the environment affected by this policy subject area is the native tree gene pool.

Within a tree species, genetically-controlled growth characteristics vary from one location to another in response to differing environmental conditions. This genetic variation in response to the environment is referred to as adaptation. Maintaining the adaptation of trees to their growing sites is one of the key considerations in managing forests. Also important to forest health and productivity is maintaining long-term genetic diversity, which enables populations of a single species to change in response to changing environmental conditions, such as new diseases or different climates. Finally, genetic growth potential affects the rate that stands are reestablished following harvest, the need for releasing seedlings from competing vegetation, wood volume production and in some cases, resistance to damaging agents, such as insects or fire. In most cases, high growth potential is more desirable than low growth potential.

The most important influence that humans have on the genetic makeup of tree populations is through decisions about the seed source used for regeneration. This is particularly true when the majority of young trees are established by planting, which is the standard and most reliable regeneration method. If inappropriate sources of seed are used, the results can range from immediate mortality of the young trees, to slower growth and predisposition of trees to insect and disease damage in later years. Use of seed that maintains adaptation and genetic diversity is central to maintenance of healthy and productive forests. Therefore, proper management of seed supply is the most critical aspect of protecting and maintaining the native tree gene pool.

Two main approaches are used to manage seed supply. One relies on collection of cones from the forest. With this approach, seed zones are used to govern where seed collected from a given area can be used. The second approach is operation of a seed production program. This approach allows for more certainty and control over issues like adaptation, diversity, growth potential and disease resistance. Testing of potential parent trees leads to more knowledge of their characteristics than is possible when collecting cones in the forest. However, seed production programs involve significant expense and can only be justified where seed needs are high. Therefore, any realistic genetic resource conservation program will involve a combination of cone collection from the forest and seed production programs where seed needs justify the expense. The department relies on a combination of these two approaches.

In addition to carefully managing seed supply, provisions should be made to address uncertainty in both current knowledge of genetic structure and conservation of rare genes. Although the principles used for managing seed supply are based on the best available science, current knowledge will never be perfect. For this reason, the department maintains a system of gene pool reserves, which are unmanaged natural stands, each of which contain enough trees to serve as a base population (see Map 3). This would allow the department to restore the pre-management genetic structure of the tree populations, if problems were to occur. A second important function of gene pool reserves is the conservation of rare genes, which may be useful or important in the future. Conserving rare genes is extremely difficult to achieve by collecting cones in the woods or in seed production programs, because it requires much larger numbers of trees than can be handled using those approaches. The gene pool reserve system includes tens of thousands of trees and is, therefore, capable of containing a large number of rare genes. Thus, gene pool reserves serve both as an insurance policy to back up carefully designed management practices and also as a repository of rare genes that could be important in the future.

The department's approach to managing and conserving tree genetic resources affects not only the 2.1 million acres of forested state trust lands, but also many acres owned by non-industrial private landowners who buy their seedlings from the department for reforestation. The department defers gene pool reserves from harvest, because timber harvest and associated road-building activities impact gene pool reserves in different ways. If all the trees are cut, the function of the gene pool reserve is lost completely. If a partial cut occurs, the value as a gene pool reserve is diminished primarily by the reduction in the number of individual trees. It may also be affected if trees with certain genetic characteristics are cut. This is the reason why unmanaged stands were originally selected for gene pool reserves. In some cases, a gene pool reserve may have to be thinned to maintain the health of the stand. In such cases, careful design with consideration of genetic issues can minimize the risk of selection pressure.

REGULATORY FRAMEWORK

The regulatory framework for tree genetic resources is the state Forest Practices Rules requirement, "Except as approved by the department to qualify as acceptable reforestation, the seedlings or seeds must be from an appropriate seed source zone. The

department shall establish seed zones and guidelines for their use” (WAC 222-34-010 (4)(a)(ii)). The department has established these guidelines and they are available via the internet at www.dnr.wa.gov/webster/seedzonebook/.

Existing gene pool reserves have been identified in several department systems. They are listed in the Asset Performance System, which appears in the Total Resource Application Cross-Reference system, as well as in the Planning and Tracking system. Gene pool reserves are also delineated as forest management units in the Planning and Tracking System, which allows users to see the spatial location. The criteria for selection of a gene pool reserve includes: 1) naturally regenerated stand; 2) at least 20 acres in size; 3) at least 400 trees of the species intended to be conserved; and 4) low probability of damage from wind, fire, harvest, development, etc.

At present, there is not a system for identifying gene pool reserves on lands other than state lands, because there have been no gene pool reserves designated for department use off of state lands. Any gene pool reserves not on state lands would need to meet the same criteria used to determine suitability on state lands. Additionally, the department would need written agreement from the landowner on which the gene pool reserve was located to allow the department to collect reproductive materials (cones, seed, etc.) from the site for an indefinite period of time.

Although seed zones, rather than ecoregions, are used as the stratification system for managing genetic resources, activities can be described by ecoregion. In all ecoregions, seed supply is carefully managed, using both cone collection and seed production program approaches. At present, gene pool reserves have been designated in the Northwest Coast, Puget Trough, North Cascades and West Cascades ecoregions. No gene pool reserves have been designated in the East Cascades, Okanogan, Canadian Rocky Mountains, Columbia Plateau or Blue Mountains ecoregions, as there are very little stands left in these ecoregions that meet the requirements of a gene pool reserve due to past harvesting practices.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION & DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 1 ensures that the genetic resource is adequately represented and protected on forested state trust lands and does not rely on other department lands or other governmental or private landowners to protect and ensure availability of genetic material on behalf of each trust beneficiary. Alternative 1 best meets the applicable policy objective by directing the department to use professional judgment, best available science and sound field forestry to ensure maintenance and protection of the trusts’ genetic resource (Policy Objective 5).

POLICY STATEMENT

Forest Resource Plan Policy No. 15, The Genetic Resource: “The department will protect and enhance a diverse gene pool of native trees on state forest lands to ensure well-adapted future, commercial forests.”

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 relies on other department lands and other governmental or private landowners as a source for genetic material to meet trust needs. Gene pools that are not well-represented on these other ownerships would be maintained and protected on forested state trust lands. Alternative 2 does not appear to meet Policy Objective 5 as well as Alternative 1.

POLICY STATEMENT

The department will maintain, protect and enhance gene pools of native trees on forested state trust lands to supplement gene pools protected and accessible on other department lands or other ownerships.

■ ALTERNATIVE 3

DISCUSSION

Alternative 3 seeks to ensure genetic diversity in the face of catastrophic events. This provides a higher level of insurance and protection, but may be in excess of what is needed to fulfill the trust obligation. Alternative 3 does not appear to meet Policy Objective 5 as well as Alternative 1.

POLICY STATEMENT

The department will, in addition to maintaining existing gene pools, increase the number of gene pools of native trees on forested state trust lands to ensure gene pool diversity in the face of catastrophic events.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

There are no significant adverse environmental impacts to the native tree gene pool from Alternative 1. Alternative 1 requires that the native tree gene pool on all forested state trust lands be protected and enhanced. This means that careful management of seed supply will ensure that all reforested areas will have appropriate genetic makeup and that the existing system of gene pool reserves will be protected on forested state trust lands. This is the most comprehensive strategy because it addresses the gene pool on all forested state trust lands by requiring attention to adaptation and diversity on all forested trust acres and provides for the gene pool reserve system to serve as an insurance policy backing up responsible management practices and conserving rare genes that are very difficult to conserve through normal reforestation procedures. Options that do not provide for protection of the gene pool across trust acres increase the risk of forest health

problems on those acres due to inadequate provisions for adaptation, genetic diversity or growth potential. Alternative 1 also provides the most control for ensuring the continued existence of the gene pool reserve system, because it does not depend upon other landowners whose goals or management practices may be inconsistent with the department's, or may change over time.

The likelihood of significant adverse impacts to the native tree gene pool as a result of Alternative 2 is increased due to the following. Like Alternative 1, Alternative 2 requires that the native tree gene pool on all forested state trust lands be protected and enhanced. This means that careful management of seed supply will ensure that all reforested areas have appropriate genetic makeup. However, Alternative 2 emphasizes shifting the insurance and rare gene conservation functions of gene pool reserves to other ownerships wherever possible. This approach has more risk, because it relies on other landowners continuing to manage their lands in a manner compatible with the functions identified by the department for a gene pool reserve. The magnitude of this risk is probably small, because realistically not many acres of gene pool reserves would be shifted to other ownerships. The reasons for this are many gene pool reserves are already located in areas that are already constrained for other reasons. Therefore, it would not be eliminated and gene pool reserves that are otherwise unconstrained tend to be in areas where few stands meet the requirements for a gene pool reserve, so opportunities for relocation are limited.

There are no significant adverse impacts to the native tree gene pool as a result of Alternative 3. Alternative 3 requires that in addition to the protections provided by Alternative 1, additional gene pool reserves will be created to minimize risk in the event of catastrophic events. If additional gene pool reserves were designated, the most prudent approach would be to locate them in places that provide better protection for a wider range of species. The original gene pool reserve system was created with a primary focus on Douglas-fir and the greatest need is for better protection of other species. However, for many of these other species, the most effective strategy may be carefully designed gene conservation plantings rather than the gene pool reserve approach. For instance, grand fir and western red cedar in Western Washington occur as scattered individuals at a fairly low frequency in most stands. Capturing enough individuals of these species using a gene pool reserve approach would require very large areas. Ponderosa pine or western larch grow in Eastern Washington where historic practices of high-grading have eroded the native gene pool. These are species for which designating small existing stands might not be as valuable as planting a collection of carefully selected seed sources that might more closely represent the original gene pool. Therefore, Alternative 3 does not provide any additional protection of gene pools than Alternative 1.

CUMULATIVE IMPACTS

Cumulative impacts of the policy alternatives for the gene pool could be positive or negative, depending on whether they resulted in forests that were better adapted or more poorly adapted to their growing sites than the forests currently growing there. Cumulative impacts occur in proportion to the rate at which existing stands are replaced with newly regenerated stands, because this is the point where the department has a significant effect on the genetic makeup of the forest.

Alternative 1 minimizes negative cumulative impacts, because it requires protection of the native tree gene pool, thus minimizing the risk of any accumulation of problems with forest health or productivity.

Alternative 2 has a similar low potential for negative cumulative impacts as Alternative 1, because it also requires protection of the gene pool. However, it includes higher risk by shifting the insurance and rare gene conservation functions of some gene pool reserves to other landowners whose management goals could change over time, but the cumulative risk is probably small.

Alternative 3, like Alternative 1, minimizes negative cumulative impacts, because it requires protection of the gene pool, thus minimizing the risk of any accumulation of problems with forest health or productivity.

3.2.4 Special Ecological Features

INTRODUCTION

Special ecological features are those species, ecosystems and other natural features that are in need of special management consideration for their long-term survival. This includes rare species and rare ecosystem types, as well as widespread ecosystem types that are threatened in some manner. These features may be priorities for inclusion within the statewide system of natural areas, including Natural Area Preserves and Natural Resources Conservation Areas. Features that are priorities for inclusion within these systems include those that are of conservation concern and all of those naturally-occurring features of the state for which there is inadequate or no representation within the natural areas system.

This group of features may include common ecosystem types. The goal of the statewide system of natural areas is to include examples that are in good ecological condition of all ecosystem types. “Good ecological condition” is a relative term, but it is meant to convey a sense of minimal human-related disturbance within a landscape context where natural ecosystem processes are still functioning.

The distribution of ecosystem types and individual species, including special ecological features, are influenced by geology, climate, natural disturbances and ecological processes. Each species and each ecosystem type occupies that portion of Washington that is suitable in terms of those factors. They are neither uniform across the landscape, nor are they random in their distribution. Therefore, the list of special ecological features varies considerably from one ecoregion to another. Some special ecological features occur in more than one ecoregion while others are limited to a single ecoregion.

The following Policy Objectives apply to this policy subject area:

- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4); and
- Identify trust lands that provide special ecological, social, or cultural benefits that are incompatible with active management, and look for opportunities to protect such areas through creative partnerships and funding mechanisms with appropriate compensation to the trusts (Policy Objective 8).

AFFECTED ENVIRONMENT

The elements of the environment affected by this policy subject area range from rare plant and animal species and rare ecosystems to representative ecosystems that meet the term “good ecological condition.”

Forest management, such as constructing a road through a population of a rare species or across a rare ecosystem type, can impact special ecological features directly. Special ecological features can also be impacted indirectly. For example, forest management may alter fire regime/behavior, thereby affecting ecological processes that, in turn, influence

the viability of a small patch ecosystem type or the immediate environment of a rare species. The nature and degree of impact of forest management varies for each special ecological feature.

Many of Washington's forested ecosystem types are widespread and much of their conservation value can be maintained through ecologically sound forest management practices. However, many of these common forest types have not yet been included in the statewide system of natural areas, so they remain priorities to be represented within a Natural Area Preserve or a Natural Resources Conservation Area.

It is important to note that there are important exceptions. There are forest ecosystem types that are quite limited in their distribution. Special management considerations may be needed for these rare forest types. They may need to be included within a Natural Area Preserve or a Natural Resources Conservation Area, or be transferred out of trust ownership.

Many ecosystem types have little or no forest component to them, yet they occur within landscape settings that are forested and are potentially affected by how those forests are managed. For example, the high quality coastal estuaries are ecologically dependent upon the adjacent upland forests and the streams flowing off of those uplands. Many other wetland types, including bogs, ponds, lakes and riparian areas, are similarly ecologically dependent on the health of the adjacent uplands.

At the species level, the greatest level of conservation concern is for species that are endemic to a very limited area, i.e., they occur nowhere else on earth. Washington has several areas that are rich in endemic species, including the Olympic Mountains within the Northwest Coast ecoregion; the Columbia River Gorge, spanning the East Cascades and West Cascades ecoregions; the Wenatchee Mountains in the East Cascades ecoregion; and the Columbia Plateau ecoregion.

Many other species are rare in Washington, but not necessarily rare globally. These species warrant special management consideration, in part as insurance against future listing needs. Many of these species are rare, because Washington happens to be at the edge of their natural range. Many of the rare species in the North Cascades, Okanogan and Canadian Rocky Mountains ecoregions are more common to the north, reaching the southern limits of their distribution within Washington. Some of the rare species in the North Cascades actually have a distribution pattern that arcs northward through Canada and westward across Alaska to Russia and the Kamchatka Peninsula. Other rare species in the Okanogan and Canadian Rocky Mountains ecoregions are more common in the Rocky Mountains. Similarly, the ecoregions that encompass the southern boundary of the state have species at the northern limits of their ranges.

Another group of rare species are characterized by being disjunct from the main portion of their range. For example, many rare species in the Columbia Plateau portion of Washington are more common in the Great Basin.

The *Natural Heritage Plan* has provided the basic framework for identifying and listing special ecological features of the state. The *Natural Heritage Plan* also provides a

process by which sites with such features may be selected for designation as a Natural Area Preserve. A number of forested trust sites have been moved from trust status to natural areas status using this basic framework. The process requires knowledge of the status and distribution of any given special ecological feature and a very detailed knowledge of the specific areas being considered for special management consideration (including being moved out of trust status). The inventory effort on forested state trust lands has lagged behind the effort on other lands, particularly federal lands. A considerable amount of additional inventory is needed to understand the overall distribution of the full suite of special ecological features occurring on forested state trust lands.

REGULATORY FRAMEWORK

For the most part, special ecological features receive little protection within the regulatory framework. Animal species that are listed under the federal Endangered Species Act are the primary exceptions; plant species, however, do not receive the same level of protection. Animal species that have been listed as endangered or threatened by the Washington State Department of Fish and Wildlife are also given limited protections.

A limited number of terrestrial habitats receive some potential protection under the department's *Habitat Conservation Plan*, but only where there is an established tie to animal species of concern. Rare plant communities and most plant species considered to be rare in Washington, as listed in the *Natural Heritage Plan*, receive no protection under the *Habitat Conservation Plan*, except coincidentally as a result of conservation strategies for special habitats.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 requires the department to identify forested state trust lands with special ecological features and seek legislation and funding to remove these lands from trust ownership. In the past, funds appropriated by the Legislature for this purpose have enabled the department to set aside properties as Natural Area Preserves or Natural Resources Conservation Areas, or to transfer ownership to other appropriate governmental agencies. These funds, about \$400 million since the late 1980s, were included as part of the department's approved budget by the Legislature. Separate legislative action has not been required. Alternative 1 does not appear to meet Policy Objectives 4 and 8 as well as Alternative 2.

POLICY STATEMENT

Forest Resource Plan Policy No. 13, Special Ecological Features: "The department will identify state forest lands with special ecological features that fill critical gaps in ecosystem diversity, and it will seek legislation and funding to remove these lands from trust ownership."

■ ALTERNATIVE 2 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 2 clarifies that the focus is generally on features of regional or statewide significance, many of which are already identified by the Natural Heritage Program. It further recognizes that the department utilizes a variety of strategies to protect special ecological features, including funding from the Legislature. Alternative 2 best meets the applicable policy objectives by protecting the special ecological features by compensating the trusts where appropriate (Policy Objective 8). In addition, Alternative 2 encourages partnering to protect special ecological features (Policy Objective 4).

POLICY STATEMENT

When in the best interest of each trust beneficiary, the department will identify forested state trust lands with special ecological features of regional or statewide significance that fill critical gaps in ecosystem diversity. The department will protect such areas through disposal, retention, creative partnerships and funding mechanisms.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

The risk of adverse environmental impacts is increased under Alternative 1 for the following reasons. Although the department would remove all lands with "...special ecological features that fill critical gaps in ecosystem diversity..." from trust ownership, Alternative 1 does not explicitly indicate intent to protect the special ecological features. It simply states that such areas will be moved out of trust ownership. In practice, Alternative 1 has resulted in a limited number of trust sites with special ecological features being transferred to a Natural Area Preserve or a Natural Resources Conservation Area category. Most of these sites remain in trust ownership with little flexibility for providing protection for the special features.

The potential for significant adverse impacts to the environment, e.g., to rare plants and plant communities, are minimized under Alternative 2 for the following reasons. Alternative 2 provides greater flexibility and includes explicit language regarding intent to "...protect such areas..." Alternative 1 and Alternative 2 differ primarily with respect to whether or not the department will retain lands with special ecological features within trust ownership. The option of moving some lands out of trust ownership is retained, but with the qualification that the special ecological features would be "protected." This could be accomplished through transfer to a department-administered natural area category or through transfer to another agency or organization with a conservation or protection orientation.

Under Alternative 2, the department would also have other options. Where it is possible to do so, the department could retain lands with special ecological features yet continue to manage them for revenue generation, as long as adequate protection for those features is provided. For example, a rare plant species occurring within a specific micro-site, e.g.,

a rock outcrop within a forested landscape, may be protected with little or no change to timber management for the site than might be used if the rare plant were not present.

CUMULATIVE IMPACTS

Many special ecological features occur in very specialized, non-forested habitats occurring within a forested setting. Others, particularly those associated with wetlands and riparian areas, receive some level of protection from existing laws, regulations, agreements, etc. As previously stated, the requirements of the department's *Habitat Conservation Plan* will result in the protection of some special ecological features that would not otherwise be protected. Alternative 2 also includes specific language regarding the intent of the policy being to "protect" the features.

Alternative 2 substantially mitigates the potential for cumulative impacts that exist under Alternative 1 by adding flexibility to protect special ecological features without the requirement to transfer the lands to other ownerships.

3.2.5 Older Forests and Old Growth

INTRODUCTION

This policy subject area addresses older forests and old growth forests on forested state trust lands in Western Washington. Eastern Washington is discussed in the Affected Environment subsection. Environmental analysis related to older forests and older forest structures developed to meet *Habitat Conservation Plan* stand structure targets in Western Washington are discussed and analyzed in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, pages 2-27 to 28, 4-22-25 and 4-189 to 219, and is hereby incorporated by reference. The environmental analysis on large, structurally unique trees from the *Draft and Final Environmental Impact Statement Habitat Conservation Plan* page 4-487, is also incorporated by reference.

The significance of the policy debate on old growth forests stems from the economic, ecological and social importance that is associated with old growth forests and the department's trust management responsibilities (Smith et al., 1995; and Thomas et al., 1993). The basis of the significance of old growth forests arises largely from the difference between its historical range of variability and the current range. Prior to the 1850s (pre-European settlement), the historical range of variability of old growth forests was estimated at between 30 to 70 percent of the forest area in Western Washington, while today only about 10 to 18 percent of the forest area is estimated to be in an old growth condition (National Research Council, 2000). Of the current extent, 80 percent is estimated to be on national forest lands (Bolsinger and Waddell, 1993).

The following Policy Objectives apply to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2); and
- Identify trust lands that provide special ecological, social, or cultural benefits that are incompatible with active management, and look for opportunities to protect such areas through creative partnerships and funding mechanisms with appropriate compensation to the trusts (Policy Objective 8).

AFFECTED ENVIRONMENT

Western Washington

Old growth forests demonstrate enormous heterogeneity in terms of their composition, function and structure. The nature of old growth leads to multiple definitions of old growth forests, even when the discussion is restricted to a limited geographic zone (Pacific Northwest Science Update, 2003; Franklin and Spies, 1991; Forest Ecosystem Management Assessment Team, 1993; and Spurr and Barnes, 1973). While the end-state of old growth seen today is significant in terms of conservation, current science is placing

as much ecological importance on how old growth forests develop, as the end-state (Spies et al., 2002).

In the Pacific Northwest, old growth forests are commonly defined in structural terms having very large living trees; large living trees with decadent crowns; large standing dead trees (snags); large down logs or woody debris; a variety of live tree sizes distributed in two or three tree canopy layers at different heights within the stand; and spatial heterogeneity across a stand in terms of clumps of trees and gaps in the forest canopy. Plant associations provide valuable information on probable historic disturbances that lead to the development of the current conditions (Spies et al., 2002). The extent of the forest stand is recognized as an important component in the definition of old growth. Stand size defines the functionality of the stand within its landscape context (Old Growth Task Force, 1984).

Having multiple definitions poses a problem not only in terms of estimating the area of old growth within a forest inventory, but also for communicating with the public and decision-makers about what type of forest is actually being discussed. The term “old growth” is well-used and has “defined” meanings for different groups. A recent United States Department of Agriculture Forest Service publication provided an illustrative summary: “The term ‘old growth’ came from foresters in the early days of logging. In the 1970s research ecologists began using the term to describe forests at least 150-years old that developed a complex structure characterized by large, live and dead trees; distinctive habitats; and a diverse group of plants, fungi, and animals. Environmental groups use the term ‘old growth’ to describe forests with large, old trees and no clearly visible human influences” (Pacific Northwest Science Update, 2003).

The most recent definition of old growth that relates to forested state trust lands is in the *Habitat Conservation Plan* glossary: “A successional stage after maturity that may or may not include climax old-growth species; the final seral stage. Typically contains trees older than 200 years. Stands containing Douglas fir older than 160 years, which are past full maturity and starting to deteriorate, may be classified as old growth. DNR’s GIS forest classification for old growth is: a dominant dbh of 30 inches or greater; usually more than eight dominant trees/acres; three or more canopy layers with less than complete canopy closure; several snags/acres with a 20 inch dbh or greater; and several down logs per acre with a 24 inch dbh or greater.” Table 2 displays the current status of old growth on Western Washington forested state trust lands, as defined by the *Habitat Conservation Plan*.

Table 2: Estimated Extent of Old Growth Stands (as defined by the <i>Habitat Conservation Plan</i>)							
HCP Planning Unit	Old Growth acreage deferred from harvest to meet existing regulatory or HCP Requirements*			Old Growth acreage not deferred from harvest to meet existing regulatory or HCP Requirements			Total
	Stand size (acres)		Sub-total	Stand size (acres)		Sub-total	
	0-80	>80		0-80	>80		
Columbia	1,110	1,180	2,290	510	320	830	3,120
North Puget	12,640	16,850	29,490	2,260	170	2,430	31,920
OESF	250	39,750	40,000	-	-	-	40,000
South Coast		10	10	-	-	-	10
South Puget	250	330	580	-	-	-	580
Straits	10	-	10	-	-	-	10
Total	14,260	58,120	72,380	2,770	490	3,260	75,640

The estimated area of old growth in the Olympic Experimental State Forest comes from a combination of the department's Forest Resource Inventory System with a field assessment (Horton, S., personal communication). Inventory only estimate is approximately 20,800 acres.

* Deferred from harvest to meet *Habitat Conservation Plan* commitments relates to nesting, roosting and foraging and dispersal habitat thresholds, marbled murrelet habitat, riparian habitat and older forest condition landscape targets in the Olympic Experimental State Forest; but does not include deferrals to meet older forest targets outside of the Olympic Experimental State Forest as required by current Board of Natural Resources policy.

In addition to the *Habitat Conservation Plan* definition, the department has distinguished those old growth forest stands on forested state trust lands that are 80 acres and larger (Old Growth Definition Task Group, 1986). While stands of less than 80 acres are fully influenced by edge conditions and are not expected to provide interior fully functioning old growth forest conditions, the forest structures can provide important components within a landscape context.

Recent legislation in 2004 (Engrossed Substitute House Bill 2573, section 905) has directed the department to convene a scientific committee to both define and inventory old growth forests on forested state trust lands in both Western and Eastern Washington. The Scientific Committee on Old Growth is developing a method to estimate the extent of old growth forests on forested state trust lands in Western Washington. This work is ongoing and will be completed no later than June 30, 2005. However, it is likely to be based on a method for assessing how forest stands compare with reference conditions in old growth forests of Western Washington. This method is called the Old Growth Habitat Index, which was originally developed by Tom Spies for forests in Western Oregon, and integrates five key elements of old forests (unpublished draft report, Pabst, 2005):

- Large trees (number of trees per hectare greater than or equal to 100 centimeters in diameter at breast height);

-
- Large snags (number of standing dead trees per hectare greater than or equal to 50 centimeters in diameter at breast height and greater than or equal to 15 meters tall);
 - Volume of down woody debris (cubic meters per hectare);
 - Tree size diversity; and
 - Stand age (years).

The Scientific Committee on Old Growth is refining this method for the purposes of identifying old growth on forested state trust lands. It would be premature to provide any quantitative estimates of acres of old growth based on the Old Growth Habitat Index method in this discussion. However, preliminary analysis by the department indicates that the amount of acres of old growth utilizing this method will likely be less than the amount of acres of old growth utilizing the *Habitat Conservation Plan* definition in Western Washington. One possible explanation for this difference is the focus on larger trees (greater than or equal to 40 inches) in the Old Growth Habitat Index method, versus the *Habitat Conservation Plan* definition (greater than or equal to 30 inches). More quantitative estimates will likely be available in time for inclusion in the *Final EIS for the Policy for Sustainable Forests*.

Using the *Habitat Conservation Plan* definition, 100 percent (75,640 acres) of old growth is deferred from harvest to meet existing regulatory and *Habitat Conservation Plan* requirements, as well as older forest targets as directed by current Board of Natural Resources policy. Attainment of *Habitat Conservation Plan* requirements and targets are expected to take 50 to 70 years in most cases. It is likely that all old growth that is defined utilizing a method similar to the Old Growth Habitat Index would also be deferred from harvest to meet current regulatory and *Habitat Conservation Plan* requirements, as well as older forest targets as directed by current Board of Natural Resources policy.

Eastern Washington

The Scientific Committee on Old Growth is currently defining and inventorying old growth forests on forested state trust lands in Western and Eastern Washington. As a result of that effort, the department will identify and analyze, through an Eastern Washington sustainable harvest calculation, the location and amount of old growth forests in Eastern Washington. At that time, the department will determine if there is a need for Board of Natural Resources policy to address Eastern Washington old growth forests. This identification and inventory effort is expected to be completed by June 30, 2005, and the Eastern Washington sustainable harvest calculation is expected to be completed within the next five years. Until that time, the department, in its land management strategies for Eastern Washington, is retaining forest structures thought to be elements of old growth forests in Eastern Washington. Along the east slope of the Cascades in the range of the northern spotted owl, the department is maintaining and developing submature and mature habitat that is expected to develop into older forest stands. In the Klickitat *Habitat Conservation Plan* planning unit, the department is retaining an average of six to 12 trees per acre of the largest diameter classes as part of its forest health and *Habitat Conservation Plan* strategies. The department is also

developing late successional forest as part of its *Loomis State Forest Final Landscape Plan* (June 1996). In addition, the department retains large diameter trees as part of its land management activities across all of Eastern Washington. At the time an Eastern Washington sustainable harvest calculation is completed, the amount, location and management of old growth forests as defined by the Scientific Committee on Old Growth will be analyzed as part of a SEPA process.

The remaining discussion relates to Western Washington only.

Old growth forests have important ecological functions. Old growth forests are biotically more complex than forests in earlier successional stages and, as a consequence, provide important habitat for various species. For example, approximately one-third of the vertebrate species using western forests were identified as likely associated with older forest conditions, including old growth (Thomas et al., 1993).

The wet, temperate, locally variable forest environment and high richness of plant species in the western Pacific Northwest are highly conducive for growth of a wide variety of fungi. Forest fungi are ecologically important to the region, because of their important role in forest food webs (Forest Ecosystem Management Assessment Team, 1993). Recent research has revealed that the diversity and productivity of mycorrhizal fungi are higher in older stands of Douglas-fir than in young or clearcut stands (Amaranthus et al., 1994). Scientists have identified 527 species of fungi that are closely associated with older and old growth forests in the Pacific Northwest (Forest Ecosystem Management Assessment Team, 1993).

Seventeen species of salamanders, including 14 endemic species, and the tailed frog are closely associated with older and old growth forests (Forest Ecosystem Management Assessment Team, 1993).

Thomas et al. (1993) listed 38 species of birds closely associated with older and old growth westside forests, including Vaux's swift (Bull and Collins, 1993), northern goshawks (Reynolds, 1989) and pileated woodpecker. Suitable cavity-nesting substrates are assumed to occur at highest densities in the large trees and snags found in old growth forests (Mannan and Meslow, 1984).

The bird species that are most closely associated with old growth forests are marbled murrelets, northern spotted owls and Vaux's swifts (Ruggiero et al., 1991). Long-term declines in the availability of suitable breeding habitat prompted the listing of the marbled murrelet and the northern spotted owl as threatened under the Endangered Species Act.

Martens and fishers are closely associated with old growth forests in the Pacific Northwest (Forest Ecosystem Management Assessment Team, 1993; and Thomas et al., 1993). The geographic distribution of martens and fishers has decreased during this century primarily due to habitat loss (Aubrey and Houston, 1992; Powell and Zielinski, 1994; and Buskirk and Ruggiero, 1994).

The red tree vole is another threatened species that is closely associated with old growth forests in the western Pacific Northwest (Forest Ecosystem Management Assessment

Team, 1993; and Thomas et al., 1993). Old growth forests with diverse understory vegetation and abundant snags and coarse woody debris typically support one and a half times more biomass and individuals than do young forests (Carey, 1995; and Carey and Johnson, 1995).

Nine species of forest-dwelling bats, including Townsend's big-eared bats, are assigned some level of special status in states where they occur. Most of these species also were targeted for special consideration in the *Northwest Forest Plan*. Most common bat species in the Washington Cascades and Oregon Coast Range are up to ten times more abundant in old growth forests than in younger forests (Thomas and West, 1991). Several species are closely associated with old growth forests, because they roost in large trees and snags with deeply furrowed bark and cavities (Perkins and Cross, 1988; Thomas, 1988; Thomas and West, 1991; Cross, 1993; Cross and Waldien, 1994 and 1995; and Perkins, 1994).

REGULATORY FRAMEWORK

A number of other department policies and management strategies potentially affect the management status of old growth forests on forested state trust lands, including Old Growth Research Areas, the Commission on Old Growth Alternatives and the *Habitat Conservation Plan*.

In 1984, the Board of Natural Resources approved the *Forest Land Management Program*, a comprehensive plan for managing state lands and the precursor to the *Forest Resource Plan*. A section of the *Forest Land Management Program* directed the department to establish seral stage deferral sites: "The department will identify and remove certain old growth stands in Western Washington from the sustainable harvest base during this planning period to retain the option of acquiring information on old growth ecological relationships which may have application to intensive timber management" (*Forest Land Management Program*, page 54).

As part of the *Forest Land Management Program*, the department identified 12 Old Growth Research Areas covering approximately 1,800 acres in Western Washington. All sites are over 80 acres in size. These areas were deferred from harvest with the intent to carry out research to help the department manage second growth forests for all ecological values. The *Forest Resource Plan* continued the deferral of these sites for much of the same purposes as identified in 1984.

In 1989, a commission was established by Public Lands Commissioner Brian Boyle. This commission formed the Olympic Experimental State Forest to gain and apply knowledge about old growth forests and modern commercial forest management. The Olympic Experimental State Forest was to be managed for both forest commodities and for ecological values. The commission specifically identified 15,000 acres of "mature natural stands" to be deferred from harvest until 2007 (*Forest Resource Plan*).

The *Habitat Conservation Plan* conservation strategies and requirements influence the management of all existing old growth forest on forested state trust lands in Western Washington. The specific *Habitat Conservation Plan* conservation strategies determine

how older forests are managed for riparian areas, the northern spotted owl, the marbled murrelet, multiple unlisted species (large, structurally unique trees) and conservation research strategies in the Olympic Experimental State Forest. These strategies are designed to develop forests that will have functional, compositional and structural-like characteristics of “old growth” forests. These forests will be managed over time to develop and maintain the specific forest conditions of structurally complex forests, while providing revenue to the trusts. Silviculture will be used as the principle disturbance regime, in combination with natural processes. In effect, the *Habitat Conservation Plan’s* multiple unlisted species conservation strategy of retaining large, structurally unique trees retains old growth components in the landscape outside of *Habitat Conservation Plan* designated nesting, roosting and foraging and dispersal habitat management areas for the northern spotted owl.

In addition to the *Habitat Conservation Plan* conservation strategies, the Board of Natural Resources approved a policy in the 2004 sustainable harvest calculation process that restated a *Habitat Conservation Plan* objective of targeting 10 to 15 percent of each *Habitat Conservation Plan* planning unit to have structurally complex forests (*Final Environmental Impact Statement Habitat Conservation Plan*, Appendix F, page IV 180) and that the department will use retention of existing old growth stands, as defined by the *Habitat Conservation Plan*, as a priority in achieving these targets. This includes the requirement in the Olympic Experimental State Forest to develop 20 percent older forest conditions in each landscape planning unit. This Board of Natural Resources direction and the *Habitat Conservation Plan* management strategies influence the designation of forest stands for conservation and management. Currently, the department conserves all of the existing old growth forests (75,640 acres) as a result of current forest conditions and *Habitat Conservation Plan* conservation strategies.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 would continue to defer from harvest for ten years 12 Old Growth Research Areas, representing approximately 1,800 acres in Western Washington. The 1992 deferral of 15,000 acres of structurally complex forests in the Olympic Experimental State Forest would continue until 2007, at which time management decisions would be made about whether to actively manage this acreage or maintain it in deferral status. Alternative 1 also retains existing old growth as defined by the *Habitat Conservation Plan* to meet the older forest targets. Alternative 1 does not appear to meet Policy Objectives 2 and 8 as well as other alternatives.

POLICY STATEMENTS

***Forest Resource Plan* Policy No. 14, Old Growth Research Area Deferrals: “During this planning period, the department will continue to defer from harvest certain old growth research stands in Western Washington to maintain the ability to acquire**

information on ecological relationships which may affect intensive timber management.”

The department will continue deferral of 15,000 acres of structurally complex forest in the Olympic Experimental State Forest until 2007.

The department will target, over time, 10 to 15 percent of each Western Washington *Habitat Conservation Plan* planning unit for older forest conditions. The department will use retention of existing old growth stands, as defined by the *Habitat Conservation Plan*, as a priority in achieving these targets.

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 would permanently defer from harvest all old growth stands, as defined by the *Habitat Conservation Plan*, outside of the Olympic Experimental State Forest, regardless of stand size. Under Alternative 2, once *Habitat Conservation Plan* targets were met, any old growth stand no longer needed to meet *Habitat Conservation Plan* or regulatory requirements or targets would likely be transferred out of trust status to permanently protect those stands from harvest activities, with full compensation to the trusts.

Old growth stands within the Olympic Experimental State Forest may be subject to experimental application of silvicultural techniques, if consistent with Olympic Experimental State Forest and *Habitat Conservation Plan* objectives. The purpose of the Olympic Experimental State Forest is to experiment with harvest and regeneration methods to enhance habitat characteristics and commodities production.

Under Alternative 2, all Old Growth Research Areas meet the *Habitat Conservation Plan's* definition of old growth and be permanently deferred from harvest. However, under Alternative 2, they would no longer be classified as Old Growth Research Areas.

Under Alternative 2, exceptions to the policy for operational considerations could be made with Board of Natural Resources approval. These exceptions could include removal of some individual trees that are part of an old growth stand to allow road construction, where no feasible alternatives for road location were available. Criteria for field operations would be developed to guide these exceptions. In all cases, Board of Natural Resources review and approval would be required for any exceptions.

Small clumps of large diameter old growth trees (greater or equal to 30 inches in diameter) and individual old growth trees would be the focus in complying with *Habitat Conservation Plan* retention requirements for large, structurally unique trees. Old growth stands, older forest stands and small clumps of large diameter old growth trees that are socially or culturally-significant would be considered for transfer out trust status with compensation, when in the best interest of the trusts. Alternative 2 appears to meet Policy Objective 8 better than Alternative 1, but doesn't appear to meet Policy Objective 2 as well as Alternative 3.

POLICY STATEMENTS

The department will target, over time, 10 to 15 percent of each Western Washington *Habitat Conservation Plan* planning unit for older forest conditions. The department will use retention of existing old growth stands, as defined by the *Habitat Conservation Plan*, as a priority in achieving these targets. Any exceptions to this policy for operational considerations will be reviewed by the Board of Natural Resources.

Inside the Olympic Experimental State Forest, the department may conduct research in old growth stands to meet the objectives of the Olympic Experimental State Forest and the *Habitat Conservation Plan*.

The department will retain large diameter (greater than or equal to 30 inches in diameter at breast height), old growth trees to meet *Habitat Conservation Plan* retention requirements for large, structurally unique trees. Department proposals to harvest any large diameter old growth trees not retained to meet *Habitat Conservation Plan* retention requirements, will be reviewed by the Board of Natural Resources, as will any other exceptions to this policy for operational considerations.

When in the best interest of the trusts, the department will transfer old growth stands and small clumps of large diameter old growth trees having high social or cultural value, out of trust status, when full compensation is secured.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 differs from Alternative 2 in that all old growth stands would not automatically be permanently deferred from harvest. Under Alternative 3, all old growth stands greater than 80 acres in size will be deferred from harvest to achieve *Habitat Conservation Plan* targets for older forest structures. Under Alternative 3, once *Habitat Conservation Plan* targets were met, any old growth stand no longer needed to meet *Habitat Conservation Plan* or regulatory requirements or targets would be evaluated for either transfer out of trust status with full compensation to the affected trusts or considered for harvesting activities.

Old growth stands within the Olympic Experimental State Forest may be subject to experimental application of silvicultural techniques, if consistent with Olympic Experimental State Forest and *Habitat Conservation Plan* objectives. The purpose of the Olympic Experimental State Forest is to experiment with harvest and regeneration methods to enhance habitat characteristics and commodities production.

As with Alternative 2, under Alternative 3, exceptions to the policy for operational considerations could be made with Board of Natural Resources approval. Old growth stands less than 80 acres that are not already deferred from harvest would be evaluated for their contribution to *Habitat Conservation Plan* older forest targets and management decisions will be made based on that evaluation. Under Alternative 3, some of the old growth stands smaller than 80 acres, i.e., currently a total of 2,770 acres, may be made

available for harvest activities at some point in time, when and where they do not contribute to attainment of *Habitat Conservation Plan* commitments or are in excess of acreage needed to meet *Habitat Conservation Plan* older forest targets.

Individual and small clumps of large diameter old growth trees would be the focus in complying with the department's *Habitat Conservation Plan* retention requirements for large, structurally unique trees. Old growth stands, older forest stands and small clumps of large diameter old growth trees that are socially or culturally-significant would be considered for transfer out of trust status with full compensation, when in the best interest of the trusts. Alternative 3 best meets the applicable policy objectives by providing the best balance between trust income and environmental protection (Policy Objective 2), including permanent protection of special old growth stands through full compensation to the affected trust beneficiaries (Policy Objective 8).

POLICY STATEMENTS

The department will target, over time, 10 to 15 percent of each Western Washington *Habitat Conservation Plan* planning unit for older forest conditions. The department will use retention of existing old growth stands, as defined by the *Habitat Conservation Plan*, 80 acres and larger as a priority in achieving these targets. Any exceptions to this policy for operational considerations will be reviewed by the Board of Natural Resources.

Old growth stands smaller than 80 acres not already deferred from harvest by regulatory and *Habitat Conservation Plan* requirements, will be evaluated for contribution to *Habitat Conservation Plan* objectives, for their social and cultural significance and conserved or managed based on that evaluation. Any proposal to harvest any old growth stands smaller than 80 acres will be reviewed by the Board of Natural Resources.

Inside the Olympic Experimental State Forest, the department may conduct research in old growth stands to meet the objectives of the Olympic Experimental State Forest and the *Habitat Conservation Plan*.

The department will retain large diameter (greater than or equal to 30 inches in diameter at breast height), old growth trees to meet *Habitat Conservation Plan* retention requirements for large, structurally unique trees. Department proposals to harvest any large diameter old growth trees not retained to meet *Habitat Conservation Plan* retention requirements, will be reviewed by the Board Natural Resources, as will any other exceptions to this policy for operational considerations.

When in the best interest of the trusts, the department will transfer old growth stands and small clumps of large diameter old growth trees having high social or cultural value, out of trust status, when full compensation is secured.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

The comparative impacts of the alternatives are illustrated in Table 3, by assessing the extent of old growth forests that may be subject to disturbance through silvicultural activities in the next decade. The distinction between the alternatives is relatively small, due to influence of existing policies and *Habitat Conservation Plan* commitments.

Table 3: Summary of Old Growth Policy Differences Among the Alternatives			
Assumption	Alternative 1 (No Action)	Alternative 2 (Permanent Protection)	Alternative 3 (Greater than 80 acres)
Old growth area deferred from harvest due to regulatory, HCP and Board of Natural Resources requirements (acres, percent of trust forest land base).	75,640 (3.6 %)	75,640 (3.6%)	72,380 (3.4%)
Old growth area not deferred from harvest due to regulatory, HCP and Board of Natural Resources requirements and potentially available for management in the next decade (acres, percent of trust forest land base).	0	0	2,770 (0.1%)

Under all three alternatives, most existing old growth on forested state trust lands would be conserved as part of the strategies to achieve existing Board of Natural Resources and *Habitat Conservation Plan* objectives. Under Alternatives 1 and 2, all 75,640 acres are deferred from harvest and under Alternative 2, old growth stands would continue to be permanently protected (primarily through transfer from trust status with full compensation), even after *Habitat Conservation Plan* requirements were met (expected to take up to 70 years in most cases). Under Alternative 3, all but 2,770 acres are deferred to meet regulatory and *Habitat Conservation Plan* requirements and Board of Natural Resources policy. It is likely that some of this 2,770 acres would be protected to meet *Habitat Conservation Plan* retention requirements for large, structurally unique trees or to also help meet older forest targets.

As such, existing old growth would continue to develop and change over time. Overall, the structural characteristics of many stands would likely remain essentially unchanged over the short-term, reflecting only incremental changes associated with tree growth and mortality. Some stands may undergo dramatic changes as a result of natural processes, such as fire, windstorms or disease. Plant and animal populations in smaller stands, i.e., less than 80 acres, would be particularly vulnerable to habitat loss and isolation as a result of such events.

Loss of these old growth stands would carry the risk of reducing or effectively eliminating the ecological benefits of the old growth habitat condition in those locations. For example, removal of large trees and snags may eliminate nest sites for cavity-

dependent birds, roost sites for bats or den sites for Pacific fishers. Reduction of canopy cover would result in changed microclimatic conditions and may increase the risk of predation by edge and generalist species on interior-dwelling wildlife species.

The severity of the effects of harvesting old growth would vary with the stand size, location and structural characteristics of the stand. Small (less than 80 acres), isolated stands may lack interior forest conditions and connectivity to other old growth stands. As such, habitat in small, isolated stands may not effectively provide all of the ecological functions described in the Affected Environment subsection. Site-specific analysis may find that some types of harvest of some small stands would not result in substantial impacts to populations of species associated with old growth forest, depending on their location. Conversely, harvest of larger stands is more likely to result in adverse impacts. This may be particularly true of relatively isolated small or large stands that provide “islands” of habitat for some species or that serve as “stepping stones” between larger patches of habitat in other areas. The impacts of silvicultural management in old growth stands would vary with the intensity of the management technique.

Under Alternative 1, old growth forests may be impacted by harvest activities after *Habitat Conservation Plan* requirements and older forest targets are met.

Under Alternative 2, all old growth forests are permanently deferred from harvest both before and after *Habitat Conservation Plan* requirements and older forest targets are met.

Under Alternative 3, all old growth forests in stands greater than 80 acres may be impacted by harvest activities after *Habitat Conservation Plan* requirements and older forest targets are met. In addition, old growth forests in stands smaller than 80 acres (2,770 acres) may be impacted by harvest activities in the next decade.

CUMULATIVE IMPACTS

The department recognizes that cumulative impacts are occurring and have the potential to occur in the future with relation to old growth forest habitats. The loss of old growth forests in the Pacific Northwest has resulted in cumulative adverse impacts of loss and endangerment of species. The listing of the northern spotted owl, marbled murrelet and various salmonid species are examples of these cumulative effects.

Old growth forests on forested state trusts lands are of minor significance, compared to the overall extent of old growth forests in Western Washington. The *Northwest Forest Plan* found that approximately 1,190,400 acres of late-successional habitat occurs on federal lands in the Western Washington Cascades physiographic province. However, the existing old growth forests on forested state trust lands play an important role in the department’s *Habitat Conservation Plan* conservation strategies. The expectation is that the overall level of cumulative impacts will be reduced in the future under all three alternatives, due to Board of Natural Resources policy; the department’s *Habitat Conservation Plan* and operational procedures; combined with state Forest Practices Rules; the *Northwest Forest Plan* and other regional programs, such as salmon recovery

efforts (Salmon Recovery Funding Board); and habitat conservation plans developed by other forestry landowners and local government utilities, e.g., Seattle City Light and Tacoma Water. These programs reduce the potential for future cumulative impacts, by requiring that landowners do their share of mitigation and avoidance.

3.2.6 Wildlife Habitat

INTRODUCTION

For the purposes of this Draft EIS, wildlife is defined as all native, non-domesticated vertebrate and invertebrate members of the animal kingdom, including fish species that are indigenous to the state of Washington. Wildlife habitat is defined as “an area with the combination of resources (such as food, cover and water) and environmental conditions (such as temperature, precipitation, presence or absence of predators and competitors) that promotes occupancy by individuals of a given species (or population) and allows those individuals to survive and reproduce” (Morrison et al., 1992). For the purposes of this Draft EIS, the analysis is focused on the forested wildlife habitat.

These definitions of wildlife and wildlife habitat recognize the full spectrum of biodiversity and that the full spectrum is vital for ecosystem integrity. Within the context of the department’s legal, regulatory and policy framework, the department has adopted a number of strategies over the past ten years that incorporate the importance of biodiversity to ecosystem integrity. The department’s Old Growth Commission Report (1989) stated that the department intended to avoid management disruptions from future listings by learning to manage for healthy ecosystems that include older forest features. The department made specific policy commitments to meet legal requirements that protect endangered and threatened species and their habitats in the *Forest Resource Plan*: “the department will place more emphasis on protecting ecosystem diversity and providing habitat for endangered and threatened wildlife and plants.” During that time, there was an emerging awareness that protecting ecosystem integrity was the key to protecting wildlife and thus, to prevent future listings. The *Habitat Conservation Plan* provides habitat conditions across landscapes to support viable wildlife populations of a number of species and, at the same time, allow stability and predictability in land management activities.

The following Policy Objective applies to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2).

AFFECTED ENVIRONMENT

The department manages 2.1 million acres of forested state trust lands. These lands provide a rich diversity of habitats, from the low elevation temperate rain forests of the Olympic Peninsula, to the dry, open ponderosa pine forests of Eastern Washington.

Like the species that occupy them, wildlife habitats occur within multiple levels of ecosystem organization. Wildlife habitats are described in this subsection in a descending hierarchical order of spatial scale: ecoregions – landscapes – local habitats – microhabitats.

Ecoregions are large areas within which local ecosystems reoccur more or less throughout the region in a predictable pattern (Omernick and Bailey, 1997). A defining feature of these ecoregions is their characteristic dominant vegetation. A description of each of the ecoregions of the state can be found in Appendix B.

Landscapes are defined in various ways, depending on the research or management context. From a wildlife perspective, the landscape can be defined as an area of land containing a mosaic of habitat patches. The size of a landscape varies depending on what constitutes a mosaic of habitat or resource patches meaningful to the particular organism. Fragmentation is one of the key processes affecting the wildlife habitat at this scale (Debinski and Holt, 2000).

Habitat at the stand level (local habitat, patch) is defined by the vegetation species composition, vertical and horizontal structure, spatial heterogeneity, etc. Microhabitats (microsites) are determined by certain microhabitat features, such as plant species, canopy coverage, soil moisture, site temperature, structure of the substrate, etc. In this subsection, three different approaches are used to typify the wildlife habitat on forested state trust lands managed by the department.

In recent years, the department has increasingly emphasized forest structure when trying to characterize and assess wildlife habitat effectiveness, i.e., habitat suitability and capability. For the multi-species strategy developed for the *Habitat Conservation Plan*, the stand structural conditions from Brown (1985) were modeled using forest age. Analyses for the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* used stand development stages to represent structural diversity and habitat values. The forest stand development classification was adapted from three principle sources: Brown, 1985; Carey et al., 1996; and Johnson and O'Neil, 2001. The three broad classes are Ecosystem Initiation, Competitive Exclusion and Structurally Complex. The department's analysis for the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* indicated that 68 percent of Western Washington forests are in the Competitive Exclusion category and 25 percent can be categorized as Structurally Complex. The Competitive Exclusion category, which dominates the department's forested lands, is the least productive phase for wildlife and biodiversity in general (Carey et al., 1996) and is more vulnerable to catastrophic disease and fire events.

Very often the habitats are characterized by one or a number of occupying wildlife species. Species-specific strategies are generally applied to endangered or threatened populations and are built to meet species needs, such as reproduction, foraging, dispersion, etc. Examples of addressing a species-specific habitat are the northern spotted owl conservation strategy in the *Habitat Conservation Plan* that directs management of spotted owl habitat at stand and landscape levels on 1.6 million acres of forested land; the interim marbled murrelet conservation strategy addressing the protection of marbled murrelet habitat and occupied sites; and the *Lynx Habitat Management Plan* for Canada lynx, which covers about 126,200 acres of department-managed land in Eastern Washington.

Multi-species strategies address the habitat for a number of ecologically similar species. Examples are the riparian conservation strategy of the *Habitat Conservation Plan* that identifies riparian management zones as habitat for salmonid species and riparian obligate species, and the uncommon habitats (talus fields, caves, cliffs, oak woodlands, balds, mineral springs and wetlands) that support a broad variety of potentially vulnerable species.

Wildlife habitats can be differentiated by the specific land management objective. Three classes of forested state trust lands have been distinguished in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* according to their management objectives: 1) riparian areas and wetlands; 2) uplands with specific objectives (species-specific habitat areas, unstable slopes, rain-on-snow areas and uncommon habitats); and 3) uplands with general objectives, i.e., habitats not included in the above categories. The proportion of these categories on department-managed land in Western Washington is as follows: riparian areas are 31 percent, upland areas with specific conservation objectives are 43 percent and upland areas with general management objectives are 26 percent (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, page 4-53).

Any of these forest management activities have the potential to impact the wildlife habitat on at least one of its spatial scales:

Timber Management Activities:

- Forest harvest;
- Forest regeneration (planting, natural regeneration);
- Forest site preparation; and
- Intermediate stand treatments (vegetation and pest control).

Non-timber Management Activities:

- Road management;
- Recreation activities; and
- Removal of specialized forest products (decorative greens, medical plants, etc.) and valuable materials (gravel, rock and sand).

The impact of the activities depends on the degree of habitat modification and the spatial extent of habitat modification. At the stand-level scale, these activities can lead to direct loss of wildlife habitat, decrease or increase of habitat suitability and change in the abundance and distribution of the invasive species. At the landscape scale, potential results include an increase or decrease in the degree of fragmentation, change in habitat connectivity and habitat availability to support the local populations.

In the last decade, the department explored forest management strategies that result in fast recovery of ecosystem and landscape functions, while at the same time maximize the economic and social benefits. The department intends to utilize, where appropriate, the type of active management known as “biodiversity pathways” (Carey et al., 1996; Carey and Curtis, 1996; Carey, 1998). The principal tool of biodiversity pathways creates diverse development of the remaining forest stand through variable density thinning, leaving snags and down wood, and creating gaps. In 2004, the Board of Natural Resources directed the department to “implement biodiversity pathways [to] simultaneously increase the production of trust revenue and complex forest habitat with a priority for habitat areas and across the landscape as appropriate.” The department proposes to focus implementation of this approach on riparian and wetland areas and upland areas designated for habitat management (Olympic Experimental State Forest; nesting, roosting, foraging and dispersal management areas) – approximately 74 percent of the total forest land base in Western Washington (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*) and concentrating primarily in areas that require development of suitable wildlife habitat or riparian function. For example, many riparian areas currently contain moderate to high levels of early stand development stages, due to past harvest or other disturbance and are not likely to change in the near future. Utilizing a more active forest management approach (biodiversity pathways) in these areas can change species and stand composition and accelerate the development of more complex stand structures (Carey et al., 1996). Thinnings (depending on site-specific conditions) stand condition, amount of trees removed and the particular wildlife habitat or riparian function being considered, can reduce the time necessary to increase stand complexity, e.g., produce decadent features, such as large trees and snags, important to wildlife and other riparian-dependent species.

For a comprehensive discussion on the potential effects associated with forest management activities in riparian areas and wetlands, refer to the Riparian Management Zones and Wetlands policy subject areas in this Draft EIS. Discussion on the environmental effects of sustainable forest management in Western Washington is provided in the analyses for the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (Chapter 4). Those analyses cover forest structure and vegetation, riparian areas, wildlife, fish, air quality, geomorphology, soils and sediment, hydrology, water quality and wetlands.

REGULATORY FRAMEWORK

This subsection presents a summary of the statutes, regulations, plans and programs related to this policy subject area. Federal, state and local government policies may also interact with state Forest Practices Rules and existing habitat conservation plans to cumulatively affect wildlife species and their habitats and are discussed under the Cumulative Impacts subsection. The primary federal law pertaining to listed endangered and threatened species and their habitats on department-managed lands is the Endangered Species Act (16 U.S.C. 1531 et seq.). Other federal laws pertaining to wildlife protection in Washington are the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) and the Migratory Birds Treaty Act (16 U.S.C. 701-718h).

The Endangered Species Act was passed in 1973 and is intended to protect and conserve species listed as endangered or threatened and conserve the habitats upon which they depend. Furthermore, the Endangered Species Act mandates that all federal agencies seek to conserve endangered and threatened species and use their resources and authorities to further such purposes. The 1982 and 1988 amendments to the Endangered Species Act require that recovery plans be developed and implemented to promote the conservation of listed species. Recovery plans have been developed for the marbled murrelet, northern spotted owl and grizzly bear in Washington.

The following federally-listed species are afforded Endangered Species Act protections under the department's *Habitat Conservation Plan*: northern spotted owl, marbled murrelet, Oregon silverspot butterfly, bald eagle, gray wolf and Columbian white-tailed deer. The following fish species were added to the Incidental Take Permits in the westside *Habitat Conservation Plan* planning units only: Columbia River Basin population segment of bull trout, Lower Columbia River steelhead, Lower Columbia River Chinook and Puget Sound Chinook, Hood Canal summer-run chum, Columbia River chum and Ozette Lake sockeye (United States Department of Agriculture, 1999; United States Department of the Interior, 1999). In addition, a "new listings" clause in the *Habitat Conservation Plan* implementation agreement allows the department to add species to their Incidental Take Permit without additional mitigation during the term of the agreement.

The following state and/or federally listed species are afforded protections under the state Forest Practices Rules (WAC 222-16-080): bald eagle, gray wolf, grizzly bear, mountain caribou, Oregon silverspot butterfly, peregrine falcon, sandhill crane, northern spotted owl, western pond turtle and marbled murrelet. In addition, bull trout and other species of fish, as well as the species defined under the "aquatic resources" provisions of the state Forest Practices Rules are also protected.

State or federally-listed vertebrates and invertebrates not previously listed are not specifically covered under either the *Habitat Conservation Plan* or current state Forest Practices Rules. Species in this category, which are associated with either late successional forests or riparian ecosystems and wetlands, may be adequately protected by *Habitat Conservation Plan* strategies or state Forest Practice Rules that were designed to protect those ecosystem elements.

Implemented in 1994, the *Northwest Forest Plan*, an ecosystem approach to forest management, covers approximately 24 million acres of federal forestland in Western Washington, Western Oregon and Northern California (United States Department of Agriculture Forest Service and United States Department of the Interior Bureau of Land Management, 1994). These two agencies jointly manage the *Northwest Forest Plan*. The lands under the plan are divided into seven different areas that encompass approximately 24 million acres. They include Congressional Reserves; Late-Successional Reserves; Adaptive Management Areas; Managed Late-Successional Areas; Administratively Withdrawn Areas; Riparian Reserves; and Matrix Lands.

The *Northwest Forest Plan* also includes an Aquatic Conservation Strategy developed to restore and maintain the ecological health of aquatic ecosystems in the *Northwest Forest Plan* area.

The standards and guidelines in the *Northwest Forest Plan*, which include riparian buffers and other protective measures, are designed to meet the Aquatic Conservation Strategy objectives over time. The Aquatic Conservation Strategy clarification allows projects that may have short-term adverse effects, such as watershed restoration projects, to move forward as long as they comply with all of the protective measures specified in the *Northwest Forest Plan*'s standards and guidelines.

The combined effects of the Aquatic Conservation Strategy and allowable uses of the *Northwest Forest Plan* work together to maintain and improve habitats for wildlife species on federal forestland. Over time, the *Northwest Forest Plan* will create millions of acres in additional late successional forest, as younger stands are preserved and silvicultural treatments are limited to helping accelerate the development of older forest stand conditions.

The State Environmental Policy Act (chapter 43.21 RCW) and State Environmental Policy Act rules (chapter 197-11 WAC) establish an environmental review standard that overlays all other state environmental policies. The state Forest Practices Act (chapter 76.09 RCW), the Wildlife Code of Washington (Title 77 RCW), the Shoreline Management Act (chapter 90.58 RCW), the Water Resources Act (chapter 90.54 RCW), the Hydraulics Code (chapter 77.55 RCW) and the Growth Management Act (RCW 36.70A.050-.060) are important state statutes that have provisions to protect wildlife and other components of the environment. These statutes are also accompanied by respective implementing regulations that apply standards for protection of public resources that are defined by statute.

The Washington State Department of Fish and Wildlife maintains a list of state endangered, threatened and sensitive species (WAC 232-12-014 and 232-12-011). In 1990, the Washington State Fish and Wildlife Commission adopted procedures that identify how species are listed, criteria for listing and de-listing, and requirements for management and recovery plans (WAC 232-12-297). These lists are separate from the federal Endangered Species Act lists, because they focus on a species' status exclusive to Washington State.

The state Forest Practices Rules define critical wildlife habitats associated with state or federally listed species and are identified in WAC 222-16-080. Specific forest practices conducted on or near critical habitat of state-designated threatened and endangered species are considered Class IV-Special activities under WAC 222-16-050(1) and must comply with SEPA, as well as other species-specific protection measures listed in WAC 222-16-080. The state Forest Practices Rules establish minimum standards for forest practices, e.g., timber harvest, road construction, application of chemicals, etc., on all state and private forestlands in Washington. In addition, spotted owl and marbled murrelet habitats are defined in WAC 222-16-085-087. Measures to protect "aquatic

resources” are addressed in each of the sections that deal with timber harvest (chapter 222-30 WAC), road construction (chapter 222-24 WAC), reforestation (chapter 222-34 WAC) and forest chemicals (chapter 222-38 WAC). The primary protection requirements are riparian and wetland buffers and protections of unstable slopes and landforms. “Aquatic resources” are defined in WAC 222-16-010 as “...water quality, fish, the Columbia torrent salamander, the Cascade torrent salamander, the Olympic torrent salamander, the Dunn’s salamander, the Van Dyke’s salamander, the Tailed frog and their respective habitats.” The department is also required to consult with the Washington State Department of Fish and Wildlife regarding the protection of listed species’ habitats when reviewing forest practices applications.

The department’s Natural Area Preserves and Natural Resources Conservation Areas include lands managed by the state to conserve important native ecosystems, rare plant and animal species and unique natural features.

Natural Area Preserves protect examples of many ecological communities, including rare plant and animal habitat. The Natural Area Preserves system presently includes 26,400 acres on 47 sites distributed throughout the state. In Eastern Washington, habitats protected on preserves include arid land shrub-steppe, grasslands, vernal ponds, oak woodlands, subalpine meadows and forest, ponderosa pine forests and rare plant habitats. Western Washington preserves include five large coastal preserves supporting high quality wetlands, salt marshes and forested buffers. Other habitats include mounded prairies, sphagnum bogs, natural forest remnants and grassland.

Twenty-five Natural Resources Conservation Areas, totaling more than 80,500 acres in Washington, protect examples of native ecosystems, habitat for endangered, threatened and sensitive plants and animals, and scenic landscapes. Habitats protected in Natural Resources Conservation Areas include coastal and high elevation forests, alpine lakes, wetlands, scenic vistas, nesting birds of prey, rocky headlands and unique plant communities. Critical habitat is provided for many plant and animal species, including rare species.

As previously stated, the department’s Natural Area Preserves and Natural Resources Conservation Areas serve to conserve important native ecosystems, rare plant and animal species and unique natural features. These state conservation areas contribute toward meeting the department’s conservation objectives, including those related to wildlife, as discussed in the Special Ecological Features policy subject area in this Draft EIS.

Other conserved and protected state lands in Washington include lands managed by the Washington State Parks and Recreation Commission. The Washington State Parks and Recreation Commission enhances and protects a diverse system of recreational, cultural, historical and natural sites located in 120 state parks, encompassing over 250,000 acres. In addition, the Washington State Department of Fish and Wildlife manages 800,000 acres across the state that provide habitat and migration routes to wild species, as well as a variety of recreational opportunities.

The largest habitat conservation plan in Washington is the department's *Habitat Conservation Plan*. The term of the agreement is 70 years from the effective date, with the provision for renewal three times, for a period of up to ten years per renewal. The multi-species *Habitat Conservation Plan* covers approximately 1.6 million acres of forested state trust land. The *Habitat Conservation Plan* covers all department-managed forestlands within the range of the northern spotted owl. This includes all of the western part of the state, as well as lands on the east slopes of the Cascade Range for northern spotted owls only, covering approximately 7 percent of all forestlands in Washington State. The *Habitat Conservation Plan* is designed to complement the recovery activities outlined in the federal *Northwest Forest Plan*.

The *Habitat Conservation Plan* minimizes and mitigates for the incidental take of all federally-listed species within the range of the northern spotted owl. In addition to the federally-listed species in Western Washington, the department sought unlisted species agreements for 43 species of concern through provision of a multi-species conservation strategy. This strategy is built upon a combination of the owl and murrelet strategies, a riparian management strategy, protection standards for eight types of uncommon habitats and mitigation measures for several of the listed and unlisted species. The *Habitat Conservation Plan* also includes measures that address wetlands, unstable slopes, roads and rain-on-snow hydrology. These protection measures are directed toward minimizing cumulative impacts on terrestrial and aquatic wildlife and their habitats and to help prevent the need for future listings of additional species.

Conservation strategies that are described in the *Habitat Conservation Plan* for the northern spotted owl, marbled murrelet and salmonids also protect habitat for many unlisted species, particularly those associated with late successional forests or riparian ecosystems and wetlands. For species that rely on uncommon habitats or habitat elements, additional measures were incorporated into the conservation objectives of the *Habitat Conservation Plan* for Western Washington only. Specifically, measures that address talus, caves, cliffs, oak woodlands, large snags and large, structurally unique trees. The *Habitat Conservation Plan* minimizes and mitigates for the incidental take of all federally-listed species in Western Washington and for the northern spotted owl on the east slopes of the Cascades.

The *Lynx Habitat Management Plan* covers approximately 126,200 acres of department-managed land. Seventy-five percent of this land is in the Okanogan Lynx Management Zone located within the Loomis State Forest. Most of the remainder falls within the Little Pend Oreille Block adjacent to the Little Pend Oreille National Wildlife Refuge. The plan was developed pursuant to WAC 222-16-080(2), which provides landowners the opportunity to develop a special wildlife management plan in lieu of the state Forest Practices Board developing rules to protect lynx habitat under the critical wildlife habitat designation. The plan outlines the department's commitment to incorporate lynx habitat associations into its timber management plans, within the department's legal mandate to provide revenue for each trust beneficiary. The department has recently modified the *Lynx Habitat Management Plan* to incorporate protection strategies listed in a no-take

letter with the Federal Services. The department is currently updating the *Lynx Habitat Management Plan* to meet the new federal requirements after the Canada lynx was listed as a federally threatened species in 2000. The new plan is expected to be completed and effective in 2005.

Several private timber companies and local government entities have completed habitat conservation plans. Most of the habitat conservation plans prepared in Washington address issues concerning multiple listed terrestrial and/or aquatic wildlife species. Through cooperation with the United States Fish and Wildlife Service and the National Oceanographic Atmospheric Administration-Fisheries, the plans allow for management of lands for various uses, while ensuring the conservation and protection of threatened and endangered species. Forest landowner habitat conservation plans represent efforts on approximately 450,000 acres of land to maintain compliance with the Endangered Species Act, while continuing land management activities.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 commits the department to provide wildlife habitat conditions that have the capacity to sustain native wildlife populations or communities. Where insufficient forested state trust lands exist, Alternative 1 anticipated the development of agreements with adjoining landowners to meet this commitment. The *Habitat Conservation Plan* and the use of voluntary agreements, both within and outside *Habitat Conservation Plan* planning units, have set wildlife objectives to help meet this commitment. Under Alternative 1, no changes to *Forest Resource Plan* Policy Nos. 22 or No. 23 would occur. Alternative 1 does not meet Policy Objective 2 as well as Alternative 3.

POLICY STATEMENTS

***Forest Resource Plan* Policy No. 22, Wildlife Habitat: “The department will provide wildlife habitat conditions which have the capacity to sustain native wildlife populations or communities. The department will develop wildlife habitat objectives based upon habitat availability and function, species status and species vulnerability and trust obligations. Where there are apparent conflicts between meeting the wildlife habitat and trust management objectives, the department will seek balanced solutions and policies.”**

***Forest Resource Plan* Policy No. 23, Endangered Species: “The department will meet the requirements of federal and state laws and other legal requirements that protect endangered, threatened and sensitive species and their habitats. In addition, the department will voluntarily participate in efforts to recover and restore endangered and threatened species to the extent that such participation is consistent with trust obligations.”**

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 recognizes that the department will, in addition to meeting state and federal requirements for wildlife habitat conservation and compliance with the *Habitat Conservation Plan*, continue to voluntarily participate in efforts to recover and restore endangered and threatened species to the extent such participation is consistent with trust objectives. Alternative 2 goes beyond Alternative 1 by also directing the department to participate with other agencies and organizations on issues related to non-listed species and habitats, when consistent with trust objectives. Under Alternative 2, Policy No. 22 would be modified and Policy No. 23 would continue. Alternative 2 does not meet Policy Objective 2 as well as Alternative 3.

POLICY STATEMENTS

The department will meet the requirements of federal and state laws and other legal requirements that protect endangered, threatened and sensitive species and their habitats. In addition, the department will voluntarily participate in efforts to recover and restore endangered and threatened species to the extent that such participation is consistent with trust obligations.

The department will voluntarily participate with federal and state agencies and other organizations or governments on initiatives related to non-listed species and habitats, when consistent with trust objectives.

When compatible with trust objectives, the department will provide wildlife habitat conditions that contribute to sustaining native wildlife populations or communities.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

Alternative 3 states that management of forested state trust lands will meet the requirements of federal and state laws, including compliance with the *Habitat Conservation Plan*. The department will also voluntarily participate with other organizations or governments in efforts to recover and restore listed threatened and endangered species and on initiatives related to non-listed species and habitats, when consistent with trust objectives. Alternative 3 then shifts the focus of voluntary efforts from a species-by-species approach, to a broader focus on ecosystem sustainability and the conservation of biodiversity. The department's voluntary conservation efforts will focus on the conservation of biodiversity, which is recognized as the fundamental guiding principle for ecologically sustainable forest management (Carey, 2003). Alternative 3 best meets the applicable policy objective by providing the right balance between trust income and promoting wildlife diversity on forested state trust lands (Policy Objective 2).

POLICY STATEMENTS

The department will meet the requirements of federal and state laws and contractual requirements that protect endangered, threatened and sensitive species and their habitats.

The department will voluntarily participate with federal and state agencies and other organizations or governments, in efforts to recover and restore state and federal listed threatened and endangered species and on initiatives related to non-listed species and habitats, when consistent with trust objectives.

The department's voluntary conservation efforts will focus on the conservation of biodiversity, which is recognized as the fundamental guiding principle for ecologically sustainable forest management.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

This analysis is introduced by a discussion describing the three general evaluation criteria that were chosen to evaluate how the proposed alternatives would impact various wildlife species and their habitats. The analysis follows this evaluation criteria discussion. The criteria are:

The degree of protection afforded to both listed (state and federal) and non-listed species and their habitat.

The state Forest Practices Rules provide a variety of protections to wildlife species, particularly for species that are state or federally listed as threatened or endangered, on all state and private forestlands in Washington not currently covered under a habitat conservation plan. These critical habitat prescriptions are listed in WAC 222-16-080. The rules provide minimum standards for forest practices and define critical wildlife habitats that may be affected by forest management activities along with measures to protect these habitats, e.g., riparian management zones, leave tree requirements, etc.

Similarly, the department's *Habitat Conservation Plan* outlines a multi-species conservation strategy that includes protection of riparian resources, uncommon habitat types and conservation measures for several listed and unlisted species. However, the *Habitat Conservation Plan* pertains to trust lands within the range of the northern spotted owl, which are limited to Western Washington and the eastern slope of the Cascade Mountains.

The criteria selected to evaluate the effects of the proposed alternatives on wildlife species and their habitats on forested state trust lands in Washington are based on potential gaps in protection provided under this current regulatory environment. These criteria are intended to address the hierarchical nature of wildlife habitat requirements.

A number of wildlife species are covered by both sets of regulations, which primarily include state and federally listed species. Specific prescriptions in the state's Forest Practices Rules (WAC 222-16-080) and *Habitat Conservation Plan* for species, such as the bald eagle, marbled murrelet, northern spotted owl, peregrine falcon, sandhill crane,

mountain caribou, gray wolf, Columbian white-tailed deer and Oregon silverspot butterfly would not change under any of the proposed alternatives. However, a number of additional species are indirectly protected under the *Habitat Conservation Plan* (primarily Western Washington) through the protection of uncommon habitats and the northern spotted owl, marbled murrelet and riparian conservation strategies. These species include the harlequin duck, northern goshawk, pileated woodpecker, common loon, Vaux's swift, Myotis bats, California wolverine, several amphibians and fisher.

There are a number of species, including some listed above, with special status or high profile that occur on trust lands in Eastern Washington that are not specifically protected under federal statute, a habitat conservation plan or the state Forest Practices Rules. These include the western toad, Dunn's salamander, Rocky mountain tailed frog (extreme Southeast Washington), Northern red-legged frog, Northern leopard frog, Cascades frog, Oregon spotted frog, Columbia spotted frog, sharptail snake, wood duck, great blue heron, northern goshawk, willow flycatcher, mardon skipper, beaver, river otter, mink, muskrat and western gray squirrel. Species in this category, many of which are associated with riparian ecosystems and wetlands, may be protected to some degree by state Forest Practices Rules that were designed to protect those ecosystem elements, e.g., riparian management zone buffer requirements. Therefore, the first criterion used to evaluate the effects of the alternatives on wildlife is the degree of protection afforded to both listed and non-listed species.

The degree of protection of unique habitat types, such as talus slopes, caves, cliffs, oak woodlands, structurally unique trees, snags, live trees and mineral springs.

Unique habitat types defined under the department's *Habitat Conservation Plan* include talus slopes, caves, cliffs, oak woodlands, structurally unique trees, snags and live trees and mineral springs. These features provide nesting, denning, foraging, perching and security habitat for numerous amphibians, birds and mammals. Under the *Habitat Conservation Plan*, protection would be provided for these habitat types on all westside planning units, but would not be applied to any eastside planning units. There is no specific guidance for protection of these unique habitat types provided under the state Forest Practices Rules. Consequently, the second criterion used to evaluate the effects of the alternatives is the degree of protection afforded to unique habitat types. This criterion addresses stand level habitat requirements.

The ability to provide a full range of stand structural development stages across the landscape.

This criterion relates to the ability of the department to proactively manage trust lands to potentially benefit a greater diversity of wildlife across the landscape. Natural and managed forests in the Pacific Northwest possess marked differences in structural characteristics, composition and function (Carey, 2003). Natural forests are spatially heterogeneous and diverse in composition. They are characterized by a mosaic of distinct forest patches of varying structural stages that provide a complex array of structural elements, e.g., snags, large live trees, coarse woody debris, soil organic matter, and vegetation communities that support a rich array of wildlife species. In contrast, managed forest, especially under short rotation schedules, where regenerating stands are typically characterized by a single tree species of one age class, lack structural and compositional

heterogeneity. These biologically simplified forests often do not possess the same structural elements or the varied vegetation communities found in natural forests and, therefore, are not capable of supporting the same diversity or abundance of wildlife.

Recent advances in forest management involve the use of biodiversity pathways to manage forests to provide economic commodities, while conserving wildlife and their associated habitats. Consequently, a foreseeable gap in protection relates to the ability of current regulations to provide a landscape level mosaic of varying structural stages on department-managed trust lands that are capable of providing the habitat needs of both listed and non-listed species. Accordingly, the third criterion used to evaluate the effects of the alternatives on wildlife is the provision of a full range of stand structural stages. This criterion addresses the landscape and ecoregional context in which wildlife habitats occur. Riparian and wetland habitats and associated microhabitat characteristics are important to many of the species not covered under the *Habitat Conservation Plan* or the state Forest Practices Rules. The department and the Federal Services are currently developing a Riparian Forest Restoration Strategy to support the riparian conservation strategy outlined in the *Habitat Conservation Plan* for Western Washington. The degree of protection afforded to these features was not considered as a criterion for evaluating the effects of the alternatives, because the level of protection provided by these regulations was assumed to remain constant under all alternatives.

The following analysis is based on these criteria and the comparison of the alternatives are broken down by the three criteria: degree of species protection, protection of unique and uncommon habitats, and landscape diversity. There are no significant adverse impacts identified for any of the alternatives. However, the alternatives vary in their degree of risk to species and habitat.

Degree of Species Protection

All alternatives will continue to meet the requirements of state and federal law, as well as other voluntary agreements, e.g., the *Lynx Habitat Management Plan* and habitat conservation plans that protect endangered, threatened and sensitive species and their habitats. However they differ in terms of the range of species afforded protection.

Under Alternative 1, there is an increased risk of adverse impacts to species not already at risk. Alternative 1 limits protection to species with special status or vulnerability, focusing the department's conservation efforts on species, habitats and locations where they are needed most. Under Alternative 1, *Forest Resource Plan* Policy No. 22 directs the department to “develop habitat objectives based on habitat availability and function, species status and species vulnerability and trust obligations.” Similarly, *Forest Resource Plan* Policy No. 23 focuses volunteer efforts on “endangered and threatened species to the extent that such participation is consistent with trust obligations.” As such, the approach taken under Alternative 1 is reactionary in the sense that it directs protective measures toward species that are already at risk.

Under Alternative 2, the potential for adverse impacts to species not currently identified as at risk is lower than that of Alternative 1. Alternative 2 contains the additional requirement for the department to participate with other agencies and organizations to recover and restore endangered and threatened species. However, the focus of these

efforts is extended to include non-listed species and habitats. The approach taken by Alternative 2 is proactive in that it addresses species and habitats that are not currently given status, but could be at risk if they experience further habitat loss, e.g., amphibians. Consequently, Alternative 2 provides protection to a greater number of species than Alternative 1. However, under Alternative 2, specific habitat targets for individual species or species assemblages may benefit small, less mobile native species, with small home ranges outside of spotted owl, marbled murrelet and riparian management areas.

Under Alternative 3, the potential for adverse impacts to species not currently identified as at risk is lower than that of Alternatives 1 and 2. Alternative 3, as under Alternative 2, requires the department to “voluntarily participate with state and federal agencies and other organizations and governments in efforts to recover and restore state and federal listed threatened and endangered species and on initiatives related to non-listed species and habitats when consistent with trust objectives.” However, voluntary efforts under Alternative 3 would involve a broad scale approach focusing on ecosystem sustainability and the conservation of biodiversity, rather than the single-species approach employed under Alternatives 1 and 2. Whereas Alternatives 1 and 2 are limited in the protection they provide by the existing amount of available wildlife habitat, the use of sustainable forest management practices, e.g., thinning, under Alternative 3 would increase the amount of structurally complex forest across the landscape, creating additional habitat. Therefore, it is foreseeable that by promoting habitat diversity across the landscape, Alternative 3 would provide protection to the greatest number of wildlife species. However, Alternative 3 may not provide the amount and suitability of wildlife habitat associated with small, less mobile native species or species assemblages. This could result in the potential increased isolation of the species and may carry a higher risk of local extirpations and decreased metapopulation resilience.

Under all alternatives, it is important to note that the Riparian Management Zones policy subject area provides additional protection to riparian obligate wildlife species, particularly for species associated with perennial and seasonal non-fish bearing streams in Eastern Washington.

Protection of Unique and Uncommon Habitats

The risk of adverse impacts to species that rely on unique or uncommon habitat features is lower under Alternative 3 than Alternatives 1 and 2, because of the department’s commitment to focus on a landscaped-based ecosystem management approach, such as biodiversity pathways.

The gap in protection of uncommon and unique habitats, such as talus slopes, caves, cliffs, oak woodlands, structurally unique trees, snags and mineral springs provided in the *Habitat Conservation Plan* and state Forest Practices Rules is assumed to remain consistent under all alternatives. The aforementioned habitats are not specifically protected outside of Western Washington. Timber harvest activities may impact these unique habitats under existing state Forest Practices Rules in Eastern Washington. It would thus potentially impact other habitats used by species associated with unique habitats. Golden eagles, for example, nest in both cliffs and large, mature trees and forage in open areas with abundant prey species. All alternatives require the department to protect listed species and their habitat. However, under Alternative 3, the department

would be directed to also voluntarily participate with state and federal agencies and other organizations or governments on initiatives related to non-listed species and their habitats when consistent with trust objectives.

Landscape Diversity

The risk of adverse impacts to species and habitats related to landscape diversity is increased under Alternatives 1 and 2. Alternatives 1 and 2 respond to the need to protect microhabitat and stand level resources, but do not address the functionality of wildlife habitats on a landscape or ecoregional scale.

Alternatives 1 and 2 both focus primarily on habitat management for individual species or groups of species. These alternatives take a passive approach to habitat management by implementing appropriate mitigation measures in response to specific timber harvest activities, but offer no improvement to forest structure over the long-term. For example, under passive management, riparian buffers are maintained as required by state Forest Practices Rules or current habitat conservation plans. This approach protects existing riparian habitats, but does nothing to improve riparian areas that were clearcut prior to current policies and are now reaching the competitive exclusion stage (mid-seral), providing little value to wildlife. Based on modeling results incorporated by reference from the department's *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (Appendix D – Table D-14, also see Sections 4.2 – Forest Structure and Vegetation, 4.3 – Riparian Areas, and 4.4 – Wildlife), passive management approaches are not likely to offer substantial improvements in the structural complexity of forests over the life of the existing *Habitat Conservation Plan* (through 2067).

The risk of adverse impacts to species and habitats related to landscape diversity is decreased under Alternative 3. In contrast to both Alternatives 1 and 2, the approach proposed under Alternative 3 shifts from a species-by-species focus to ecologically sustainable forest management, utilizing tools such as biodiversity pathways (see Appendix F). Biodiversity pathways management would involve thinning riparian stands that were previously harvested to improve their function and thus, their value as wildlife habitat. The intent is to allow the department to take full advantage of the ecosystem management direction it has set and allow proactive changes to occur as the monitoring, research and adaptive management protocols set by the *Habitat Conservation Plan* and *Forests and Fish Report* provide credible evidence of the potential effectiveness of such changes. Based on the modeling results associated with the adopted sustainable harvest alternative, Alternative 3 has the greatest potential to increase the amount of structurally complex forest, create a greater diversity of stand structural stages across the landscape and provide the most fully functional forest over the long-term (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*).

CUMULATIVE IMPACTS

The following discussion analyzes the potential cumulative impacts of the alternatives within the larger context of past, present and reasonably foreseeable actions on wildlife resources.

All alternatives have the potential to impact wildlife and wildlife habitats. The greatest cumulative impacts would be expected in watersheds where the department's trust ownership is greatest. For other watersheds where state trust land is small, impacts to wildlife resources will be dependent on other landowners, e.g., federal lands, private lands under a habitat conservation plan, or private forestlands subject to state Forest Practices Rules. In the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, the department proposed that it was most likely to have the ability to influence cumulative impacts in those watersheds in Western Washington in which the department holds more than 22 percent of the land consisting of 83 watersheds within Western Washington. On department-managed lands in Western Washington, 158 out of 173 watersheds have more than one third of state trust land in land classes that implement specific management strategies to mitigate specified sources of potential cumulative impacts. Forest management activities under all alternatives would comply with the protection measures described above, which include management strategies and mitigation measures such as riparian management zones, leave tree requirements, potential slope instability requirements, protection of uncommon habitats and northern spotted owl and marbled murrelet habitat in key areas. These protection measures are directed toward minimizing cumulative impacts on terrestrial and aquatic wildlife and their habitats and would maintain the same level of protection under all alternatives.

The alternatives differ in terms of their potential to impact long-term landscape level trends in wildlife habitat. Alternatives 1 and 2 both focus primarily on habitat management for individual species or groups of species. These alternatives take a passive approach to habitat management by implementing appropriate mitigation measures in response to specific timber harvest activities. This regime is consistent with much of the federal management of forestlands in Washington State, that involves little use of silvicultural treatment to improve forest structure. Similarly, most large private land ownership is focused on timber production, unless otherwise restricted by a habitat conservation plan with the Federal Services, and non-industrial land ownership consists of a mixture of passive and commercial timber harvest and forest conversion activities (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*).

The relative potential for minimizing adverse cumulative impacts from activities on forested state trust lands may be highest under Alternative 3, compared to the other alternatives. The probability for adverse cumulative impacts associated with having less-than-fully functioning forest stands, e.g., previously harvested stands in the competitive exclusion stage, is higher under Alternatives 1 and 2. Modifications to *Forest Resource Plan Policy Nos. 22 and 23* would allow the department to move from a species-by-species management approach, to a more proactive ecologically-based landscape approach, focusing on ecosystem sustainability and the conservation of biodiversity, rather than the single-species approach employed under Alternatives 1 and 2.

Under all alternatives, other management actions would continue to occur on and adjacent to department-managed trust lands that could add to cumulative impacts on

wildlife and wildlife habitats. Through direct removal of habitat and disturbance, activities such as road building, logging, recreation, urban development and the removal of other natural resources, e.g., mineral products, will continue to contribute to habitat degradation, habitat loss and displacement of individuals. These impacts reach multiple spatial scales ranging from altering microhabitat characteristics, e.g., increasing stream temperature through the removal of shade-providing riparian vegetation, to contributing to habitat fragmentation at the landscape and ecoregional scales. However, measures to reduce cumulative impacts are addressed through many of the aforementioned regulations, plans, policies and programs and would not likely differ under any of the alternatives.

Implementation of any of the proposed alternatives would be consistent with the Endangered Species Act, the *Northwest Forest Plan*, the department's *Habitat Conservation Plan*, other private and local government habitat conservation plans and state Forest Practices Rules through compatible resource management and by furthering the protection of threatened and endangered species and their habitats on forestlands regulated by the Washington State Forest Practices Act. Under Alternative 3, this would be accomplished through continued measures aimed at protecting riparian and aquatic habitats, such as riparian management zones, continued protection of state and federally-listed species and non-listed species through existing policies and modifications to *Forest Resource Plan* Policy No. 23, habitat conservation plans, adaptive management, voluntary programs and providing greater amounts of structurally complex forest over time on department-managed lands.

In addition to *Forest Resource Plan* Policy Nos. 22 and 23 in Alternative 1 being reviewed under this policy subject area, other policies within the *Forest Resource Plan* that may directly or indirectly conserve and protect listed/non-listed species and their habitat are also being analyzed in this Draft EIS. They include: Policy No. 9, Forest Health; Policy No. 10, Fire Protection; Policy No. 13, Special Ecological Features; Policy No. 14, Old Growth Research Areas; Policy No. 15, Genetic Resources; Policy No. 19, Watershed Analysis; Policy No. 20, Riparian Areas; Policy No. 21, Wetlands; and Policy No. 30, Silvicultural Activities.

3.2.7 Watershed Systems

INTRODUCTION

The department manages forested watersheds, which are an important resource for the state of Washington. Forested watersheds are drainage basins that contribute water, organic matter, dissolved nutrients and sediments to streams, rivers, lakes or the ocean. These watersheds vary in size from small stream subbasins as small as 1,000 acres, to Water Resource Inventory Areas that are of hundreds of thousands of acres in size. *Habitat Conservation Plan* planning units contain multiple Water Resource Inventory Areas.

Forested watersheds are water sources for municipal water supplies, irrigation, stream and subsurface flows throughout the state. They also provide quality habitat for aquatic organisms, as well as recreational opportunities. The condition of the forest in these watersheds has a significant influence on the quality and quantity of the resource. The nature of the forest cover can also influence the timing and magnitude of peak water flows. Therefore, how the forest is managed is of critical importance to controlling and mitigating probable significant adverse cumulative impacts related to water quality and quantity.

The following Policy Objectives apply to this policy subject area:

- Ensure policies are succinct, relevant and easily understood by the public and department employees (Policy Objective 3);
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5); and
- Pursue outcome-based management within a flexible framework (Policy Objective 6).

AFFECTED ENVIRONMENT

The primary elements of the environment affected by the Watershed Systems policy subject area are water quantity and water quality. The following discussions of these two primary elements incorporate other elements of the natural and built environment: surface water, runoff, absorption, ground water, aquatic habitat, floods, public water supplies, recreation, environmental health, earth, soils, topography, erosion and landslides.

The quantity of both surface and groundwater produced by forested watersheds is controlled, for the most part, by the local climate. Climate varies considerably over the state of Washington. Annual precipitation ranges from about 80 inches to 200 inches in the Northwest Coast ecoregion. In the Puget Trough ecoregion, annual precipitation ranges from below 30 inches to about 65 inches. As elevations increase in the North Cascades and West Cascades ecoregions, annual precipitation increases to a little more than 100 inches. The climate changes dramatically east of the Cascade Mountains. Some

high elevation sites in the Canadian Rocky Mountains and Blue Mountains ecoregions receive as much as 70 inches per year. However, most of the forested watersheds managed by the department in these ecoregions and in the East Cascades and Okanogan ecoregions receive between 15 inches and 40 inches annually (see Appendix B).

The proportion of precipitation that becomes surface water or groundwater is strongly influenced by the forest. Forest vegetation intercepts and stores some of the incoming precipitation. Most of this water is lost to the atmosphere. Because undisturbed forest soils are covered by an organic layer and have high rates of absorption, or what is called infiltration, most of the precipitation or snowmelt that reaches the forest floor is either held in storage near the surface or infiltrated into the soil. When the quantity of water infiltrating into the soil exceeds the soil's capacity to hold water against gravity, free water is available to percolate down to groundwater aquifers or move laterally to a stream, lake or pond. The roots of forest plants extract water held in the soil for transpiration processes. Extracted water is either stored in the plants or lost to the atmosphere. Therefore, the quantity of free water is a function of the balance between the amount of infiltration, soil water-holding capacity and the rate of transpiration by forest plants.

The forest also influences stream discharges over time or what is called the stream hydrograph. At the lower elevations, below approximately 1,500 feet of the Pacific Coast, Puget Trough, North Cascades and West Cascades ecoregions, the forest influences on the quantity of free water have the greatest effect on stream hydrographs. This is because rain is the dominant form of precipitation. Snow occurs more frequently, but temporarily, at the mid elevations, between approximately 1,500 and 2,500 feet. Warm air masses associated with winter storms can rapidly melt the snow at these elevations. The forest canopy influences snow accumulation and the rate of melt. Interception by the canopy reduces the amount of snow that accumulates on the ground. The forest vegetation also slows down the movement of the warm air across the snow surface and moderates the rate of melt. For the high elevation areas on the Olympic Peninsula, the North Cascades and West Cascades ecoregions and all the ecoregions on the eastside of the Cascades, the forest influences on snow accumulation and melt are dominant in affecting the magnitude and timing of stream hydrographs. In addition to modifying air movement, the canopy shading the snow pack from solar radiation is also important in slowing the melt rate.

Forested watersheds are generally a source of high quality water. The fact that most undisturbed forest soils are quite porous and most of the water is filtered by the soil column before reaching a surface water body minimizes sedimentation from surface erosion. The principal means of transporting sediment to water bodies is landslides. While landslides occur in the undisturbed forest, the forest vegetation can have a stabilizing influence that minimizes the frequency of these events. The high adsorption capability of forest soils, combined with the nutrient uptake by vegetation, minimizes the leaching of dissolved solids and their delivery to surface and groundwater. The forest canopy also provides shade to surface water bodies to moderate solar heating.

Forest management can change the quantity of water produced and the timing of delivery to water bodies and aquifers. Timber harvest almost always increases water production, except in areas where fog drip caused by condensation on the forest canopy is a significant contribution. In these areas, timber harvest may not substantially increase water production. Water increases are the result of decreasing interception losses and decreasing transpiration. Timber harvest can also change the timing of delivery to surface waters in snow-dominated areas by advancing the start of the melt season and increasing the rate of melt. Road construction and other activities that compact soil reduce infiltration and produce surface runoff. Surface runoff delivers water more quickly to water bodies. In some cases, the quantity delivered will also be greater, because losses such as transpiration are avoided. All these effects require a significant amount of time before a site recovers to pre-disturbance conditions. The influences of current activities added to those of previous activities are commonly called cumulative impacts.

Water quality can be influenced by forest management activities in several ways. Timber harvest will reduce nutrient uptake and increase the amount of water moving through the soil column. These effects increase the quantity of dissolved solids delivered to surface and groundwater, changing water chemistry. However, these changes are relatively minor compared to the influences of activities, such as fertilization and vegetation management, which, by adding chemicals to the watershed system, can cause adverse conditions for aquatic life. If removal of timber that is shading surface waters is allowed, water temperatures can increase. Increased temperatures may create less than optimal conditions for certain fish species and lower dissolved oxygen levels. However, the greatest potential for forest management to influence water quality is when activities create conditions that would increase the quantity of sediment delivered to surface waters. Those activities that increase surface runoff provide both an erosion and transport mechanism for sediment delivery. The influences of timber harvest on the quantity of subsurface water can, in some cases, increase the frequency of landslides. On certain landforms, timber removal and road construction can weaken the stability of a slope and increase landslide frequency.

REGULATORY FRAMEWORK

The department addresses the potential impacts from forest management influences on forested watersheds by adhering to current laws, rules and contractual obligations. Almost all department forest management activities are subject to an assessment by SEPA. These assessments consider the influences on water quantity and quality, including their potential cumulative impacts. Forest practices activities are subject to the state Forest Practices Rules (WAC 222). One of the goals of the rules is to meet the requirements of the federal Clean Water Act in the state of Washington and ensure best management practices are prescribed to protect water quality. Water quantity is also addressed to some extent. The state Forest Practices Rules also provide methods for addressing cumulative effects through watershed analysis. While this is not mandatory, the department's proprietary program has participated in several watershed analyses.

The department generally limits the size of even-aged harvest units to 100 acres. Even-aged harvest systems are those harvests that produce stands that are of the same relative

age and usually involve retention of 20 or less trees per acre, e.g., regeneration harvest, seed tree and final shelterwood removals. Limiting the acreage of these harvest areas helps moderate the impacts to watershed systems (*Final Environmental Impact Statement for the Proposed Forest Practices Rules and Regulations*, pages 4 and 91; and the *Final Environmental Impact Statement for the Forest Resource Plan*, page 104).

Additionally, the department's *Habitat Conservation Plan* includes a riparian management strategy that prescribes methods to protect water quality and to some extent, moderate influences on stream hydrographs and the resulting cumulative impacts. In many cases, the *Habitat Conservation Plan* prescribes more protective methods than state Forest Practices Rules. The *Habitat Conservation Plan* also states that the department will participate in regulatory watershed analysis. The department interprets this to mean when initiated by other landowners or the state Forest Practices Program and when forested state trust lands would be included.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 does not recognize that there are multiple ways to address the impacts of department activities on watershed systems and, although unintended, has been interpreted as a commitment to rely on the regulatory watershed analysis process to analyze and control cumulative impacts. Policy No. 19 was adopted prior to development of the *Habitat Conservation Plan* and additional state Forest Practices Rules that have substantially increased protection of watershed systems. In addition, the department uses an expanded SEPA checklist for each timber harvest that provides information related to the potential for cumulative impacts in the watershed where the harvest is located. The department also engages in forest land planning. Those plans are subject to review under SEPA and include analysis of cumulative impacts. All of these protection measures have, in some cases, reduced the need to carry out regulatory watershed analysis for the purposes of forested state trust land management and environmental protection. Alternative 1 does not appear to meet Policy Objectives 3, 5 and 6 as well as other alternatives.

POLICY STATEMENT

***Forest Resource Plan* Policy No. 19, Watershed Analysis: “The department will analyze by watershed the effects of past, present and reasonably foreseeable future activities on water quality and quantity and it will modify operations to control risks to public resources and trust interests.”**

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 suggests the department's *Habitat Conservation Plan* and existing laws governing cumulative impacts analysis and watershed protection (such as SEPA, the state Forest Practices Act, the state Forest Practices Rules, the state Hydraulics Act and the federal Clean Water Act, will appropriately protect key watershed resources and systems. Alternative 2 appears to better meet Policy Objectives 3, 5 and 6 than Alternative 1, but not as well as Alternative 3.

POLICY STATEMENT

The *Habitat Conservation Plan* and existing laws governing cumulative effects analysis and watershed protection, such as the State Environmental Policy Act, the Forest Practices Act, the state Forest Practices Rules and the Hydraulics Act, will appropriately protect key watershed resources and systems.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 recognizes that there are multiple ways to assess impacts of department activities on watershed systems, including participation in regulatory watershed analyses when initiated by other landowners or the state's Forest Practices Program. In addition to meeting all legal requirements, Alternative 3 directs the department to focus the analysis of cumulative impacts within the full range of forest land planning processes and when necessary, develop mitigation strategies. Alternative 3 best meets the applicable policy objectives, as it allows the department to use professional judgment and best available science to analyze and mitigate the effects of its activities where there are risks to watershed systems (Policy Objectives 5 and 6). In addition, Alternative 3 clarifies that there are multiple ways to analyze the impacts to watershed systems and that the department will not solely rely on regulatory processes to protect watershed resources (Policy Objective 3).

POLICY STATEMENTS

The department will participate in watershed analysis as defined by state Forest Practices Rules when initiated by other landowners or by the state's Forest Practices Program, in watersheds containing forested state trust lands.

To moderate the impacts of department activities on watershed systems, the department will generally limit the size of even-aged harvest units to 100 acres.

The department will analyze cumulative effects of department activities on watershed systems as part of its forest land planning process and, when necessary, develop mitigation strategies.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Alternative 1 is Policy No. 19 in the *Forest Resource Plan*. The department has been assessing the condition of watershed systems using additional methods to those required by laws, rules and agreements. Risk assessment and prescriptions for mitigating cumulative impacts are included as part of its process.

This policy directly addresses cumulative impacts within watershed systems by mandating risk assessment and modifying proposed activities when necessary. It is as effective in protecting water resources and aquatic habitat as Alternative 2. However, it was formulated prior to both the adoption of state Forest Practices Rules for watershed analysis and the approval of the *Habitat Conservation Plan*. Implementation of the policy was strongly linked to a landscape planning process (see the Forest Land Planning policy subject area discussion).

Alternative 2 primarily relies on the State Environmental Policy Act and Rules, the state Forest Practices Act and Rules, the *Habitat Conservation Plan* and other laws and agreements for addressing cumulative impacts on watershed systems. The potential for cumulative impacts are analyzed at the elevations of the rain-on-snow zone and located within the jurisdiction of the *Habitat Conservation Plan*; for sustainable harvest implementation plans as a result of the adoption of a Sustainable Harvest Calculation for Western Washington; for site specific proposals statewide through the expanded SEPA checklist; and in other situations when an EIS is prepared on any other plan or proposal. However, it does not provide the broad flexibility to analyze the potential for adverse cumulative impacts and develop mitigation strategies at additional scales of planning where it may be necessary to address unique circumstances. Therefore, there is a higher risk that cumulative impacts may go undetected until adverse impacts occur. This may cause future options for management within a watershed to be limited.

Alternative 3 is just as effective as Alternative 1 in protecting water resources and aquatic habitat. However, it provides the department more flexibility in how this would be accomplished. If forested state trust lands are located within a Watershed Administrative Unit where another landowner has initiated a forest practices watershed analysis, the department can determine potential cumulative impacts on the water resource and aquatic habitat and prescribe mitigation measures through this process. When and where the strategies of the *Habitat Conservation Plan* adequately address cumulative impacts on watershed systems, no further analysis would be needed. If a significant risk of cumulative impacts is determined through a forest land planning process, further analysis will be conducted to provide information for developing strategies that would mitigate the risk (see the Forest Land Planning policy subject area discussion). Additionally, as in Alternative 2, site-specific proposals will be subject to an assessment of the potential for adverse cumulative effects through the expanded SEPA checklist.

CUMULATIVE IMPACTS

All the alternatives directly address how the department would approach cumulative impacts assessments of forest management on forested watersheds for impacts related to water quantity and water quality. These assessments are not limited to forested state trust lands, but they consider the proposed management strategies or practices on forested state

trust lands and the potential of those strategies and practices in combination with practices on other ownerships to contribute to or cause negative cumulative impacts to watershed systems.

The degree to which the department is limited to one particular approach in Alternatives 1 and 2 will negatively affect the department's ability to address and mitigate adverse cumulative impacts that occur from changes to water quality and quantity, as discussed in the Affected Environment and Significant Impacts and Mitigation Measures subsections. Consistent with the Forest Land Planning department-recommended alternative, under Alternative 3, flexibility is maintained to address the potential for adverse cumulative impacts through maintaining the option to integrate cumulative impact analysis over the broader spectrum of SEPA analysis ranging from the landscape scale to site-specific planning.

3.2.8 Riparian Management Zones

INTRODUCTION

Riparian areas are areas where land and water meet along stream and lake margins. Riparian areas include stream banks, adjacent floodplains, wetlands and associated riparian plant communities. Riparian areas are important for wildlife and for protecting water quality. The interaction between aquatic and terrestrial ecosystems and the extensive edges where riparian areas adjoin upland habitats promote high riparian and aquatic wildlife diversity and are a critical source of biodiversity.

The following Policy Objectives apply to this policy subject area:

- Ensure policies are succinct, relevant and easily understood by the public and department employees (Policy Objective 3); and
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5).

AFFECTED ENVIRONMENT

Riparian areas are shaped by a wide variety of hydrologic, geomorphic and biotic processes and they are distinctly different from the surrounding lands, because of unique soil and vegetation characteristics that are strongly influenced by the presence of water. Disturbance processes from upland areas, such as windthrow or fire, as well as from processes unique to riparian areas, such as floods, affect the riparian ecosystem (*Final Environmental Impact Statement on Alternatives for Forest Practices Rules*). Natural disturbance and fluvial processes continually work together in these areas to create distinctive ecosystems supporting diverse vegetation communities and, consequently, diverse animal communities. The interaction between aquatic and terrestrial ecosystems and the extensive edges where riparian areas adjoin upland habitats further promote high wildlife diversity (Thomas et al. in Bunnell et al., 1995) and are a critical source of biodiversity (Stevens et al., 1995). A number of plant species considered rare in Washington are associated with forested riparian areas in both Eastern and Western Washington.

Vegetative productivity is frequently high due to high soil moisture and abundant nutrient availability. “Because of their high productivity and their inherent connections with the rest of the watershed, riparian areas provide a crucial source of habitat diversity at the landscape level” (Banner and MacKenzie, 1998). Climate, soils and topography influence the extent, composition and functions of riparian areas. Within ecoregions, the riparian ecosystem changes with its topographic position within the landscape as it traverses broad vegetation belts from small headwater streams to the floodplains of large rivers.

A pronounced difference occurs between the arid ecoregions of Eastern Washington and the ecoregions of high rainfall near the crest and west of the Cascade Range (Wissmar et al., 1994). The arid ecoregions, in particular, have marked contrasts in species

composition and physiognomic structure between riparian areas and uplands (National Academy of Sciences, 2002).

Riparian areas west of the Cascade Range, with the exception of the Puget Trough ecoregion, are influenced by high annual precipitation. The coastal zone and areas below 2,000 feet in elevation usually receive all precipitation as rain and show rapid response to rainfall. At higher elevations, snow cover can occur from October to March. Significant flooding events can take place during periods of warm air mass movement (rain-on-snow events). Drainages in the Northwest Coast, West Cascades and North Cascades and Puget Trough ecoregions commonly have significant contributions of discharge, both in headwater and downstream portions of a river basin.

Disturbance from natural events, such as flooding and from human activities, has shaped the riparian areas. In general, the riparian areas of the westside ecoregions are composed of a mix of hardwood and conifer species. In headwater streams with typically narrow riparian areas, upland species tend to dominate. Lowland rivers and areas with frequent flooding are dominated by tree species adapted to high water tables and frequent inundation, such as black cottonwood, willow and red alder. Westside rare plant species associated with riparian areas are usually perennial forbs or sedge species (*Natural Heritage Plan*).

The ecoregions of Eastern Washington: the East Cascades, Okanogan, Canadian Rocky Mountains and Blue Mountains, are generally characterized by a more continental climate. Most precipitation occurs as snow and accumulates as a cold snow pack. Most of the stream flow occurs during the annual melt of May, June and July from the headwaters, with minimal contributions from downstream water sources resulting in snow-melt-induced flood regimes. Precipitation in the Eastern Washington ecoregions varies with elevation, ranging from 50 inches per year above 5,000 feet in elevation to 10 to 15 inches per year at lower elevations (Wissmar et al., 1994). Riparian areas are strongly influenced by elevation with most forested riparian areas occurring in steep, mountainous terrains that are dominated by conifers. At lower elevations, a mix of conifers and hardwoods can be found in moist riparian areas. Although riparian ecosystems are only a small portion of the Eastern Washington landscape, they are disproportionately important as habitat (Kovalchik and Clausnitzer, 2004). However, riparian ecosystems in these ecoregions face unique challenges, as they have been and are being continually degraded by a combination of agriculture and irrigation, livestock grazing, forest management and mining (Wissmar et al., 1994). Rare plants associated with Eastern Washington riparian areas include shrubs, forbs, sedges and annual species (*Natural Heritage Plan*). Riparian areas in Eastern Washington are more strongly differentiated from surrounding uplands than riparian areas in Western Washington, and therefore provide a more specialized habitat for rare plant species. As a result, Eastern Washington habitats for rare riparian plant species may be more susceptible to impacts associated with management activities.

Riparian vegetation is the result of physical conditions created by the geomorphic and hydrologic processes in the stream channel, hydrologic conditions in adjacent uplands and the responses by plants (Kattelman and Embury, 1996). In turn, the riparian area provides critical functions for the adjacent stream. Impacts to riparian functions affect

several elements of the environment: earth, geology, soils, topography, erosion, climate, water quality and quantity, flooding, plants, animals, habitat, fish and wildlife.

Root systems of trees, shrubs and other low growing woody vegetation along streambanks contribute to slope stability. Root systems in streambanks of active channels stabilize banks, allow development and maintenance of undercut banks and protect banks during large storm flows (Forest Ecosystem Management Assessment Team, 1993). Streamside vegetation also plays an important role in reducing the amount of sediment reaching the stream by physically obstructing the movement of sediment into the water.

Direct solar radiation can affect stream temperature. Numerous factors affect how much solar radiation reaches the stream, including stream size, orientation, topography and the characteristics of the riparian vegetation, such as tree species composition, tree height and stand density. Increases in direct solar radiation due to reduction of riparian vegetation is most responsible for high stream temperatures. Forest management can exert influence on stream temperature only by preventing further solar heating through shade management.

In general, due to their low-lying position on the landscape, riparian areas tend to be cooler than the surrounding upslope areas. Since riparian areas are adjacent to water bodies, they also have higher relative humidity levels. A discussion of this is incorporated by reference from the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Chapter 4, pages 4-38 to 4-39. Air temperature and humidity in turn are important variables influencing water temperature, an important component of fish habitat. For other riparian obligate species, such as many amphibians, the microclimate provided by riparian areas also plays an important role.

Organic debris such as leaves, conifer needles, cones and wood falling into the water are part of the food chain, providing nutrients to aquatic invertebrates, which in turn are an important food source for fish. The abundance and diversity of aquatic species can vary significantly, depending upon the total and relative amounts of algae and leaf litter inputs to a stream (Independent Multidisciplinary Science Team, 1999). In general, the forest influence on providing organic input diminishes as streams become progressively larger with higher order streams, relying more on in-stream processes, such as algae production for organic material input (Sedell et al. in Maser et al., 1988).

An important factor in determining the quantity of exported invertebrates and detritus from smaller headwater streams appears to be the type of riparian vegetation. Young-growth alder canopies provide more invertebrates and detritus for the benefit of downstream communities than conifer-dominated forests. The forest type and its associated understory in general plays a major role in the amount and quality of food entering streams and ultimately affecting fish populations (Wipfli, 2001).

Riparian areas are an important source for providing large woody debris to stream channels. Large woody debris is defined as a log with a mid-point diameter of at least 10 centimeters, a length of two meters and protruding into the bankfull channel (Center for Water and Watershed Studies, 2004). Recruitment to stream channels occurs through various processes' such as tree mortality, wind-throw, bank erosion, channel migration,

landslides and debris avalanches. Large quantities of downed trees are a functionally important component of many streams (Forest Ecosystem Management Assessment Team, 1993). Large woody debris can trap fine sediments; retain spawning gravel; provide structural diversity, such as pools; provide nutrients and protective cover from predators; and fulfill other functions that promote fish habitat (Center for Water and Watershed Studies, 2004).

Riparian areas provide a specialized habitat for rare plant species by providing greater moisture, more consistent moisture through the growing season and often greater shading than surrounding uplands. Species that are adapted to these conditions depend on the maintenance of undisturbed riparian areas for population persistence.

Any forest management activity in or near riparian areas has the potential to negatively impact water quality, terrestrial and aquatic habitat, rare plant habitat and other riparian functions and values (Phillips et al., 2000). However, because many riparian ecosystems have been degraded due to past management practices, active restoration of riparian areas may be desirable. Resulting short-term reductions in some riparian functions may be acceptable if the restoration of riparian areas to full functionality can be hastened. For example, many streams and riparian areas are deficient in large woody debris and large woody debris recruits because of past stream cleaning practices and the lack of regulations governing timber harvest in riparian areas. Of all the ecological functions of riparian areas, the process of large woody debris loading into channels, lakes and floodplains requires the longest time for recovery after logging. Active forest management, such as thinning, can accelerate the development of large woody debris recruits and augment existing large woody debris levels through directional falling of trees.

Riparian ecosystems are protected through management restrictions in areas adjacent to water bodies referred to as the riparian management zone. Nevertheless, some riparian functions can potentially be reduced by forest management activities and associated road building activities in or near riparian areas.

Sediment is the primary pollutant associated with forest management activities (Phillips et al., 2000). Fine sediment can be delivered through surface erosion from skid trails, stream crossings and roads in riparian areas. Rutting and soil compaction may lead to decreased infiltration and channelization, further increasing the risk of sediment delivery.

The amount of direct solar radiation can be impacted by forest management activities by reducing the amount of canopy cover and therefore, the amount of shade. This can result in elevated stream temperatures and negative impacts to aquatic species. A change in solar radiation levels can also negatively affect rare plant species in the riparian area that are adapted to the shaded, high moisture conditions of an intact riparian zone.

The loss of root strength through tree removal, soil compaction and disturbance of the understory vegetation may lead to increased incidence of debris slides and flows (Forest Ecosystem Management Assessment Team, 1993). Roads have the greatest effect of all management activities on slope stability (*Final Environmental Impact Statement on Alternatives for Forest Practices Rules*).

Litter inputs to maintain biotic community structures in the stream may be reduced. The removal of vegetation may alter the microclimate and therefore, affect a variety of ecological processes and habitat conditions. The application of herbicides and pesticides can result in adverse impacts on water quality, rare plant populations, and fish and wildlife species.

Current conditions of riparian areas in Washington are mostly a function of past management practices. Most riparian areas have been logged at least once leading to a simplification of composition and structure of riparian vegetation. Little is known about the current condition of rare plant populations in riparian areas on forested state trust lands, because little inventory for rare plants has occurred on these lands.

The *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Chapter 4, pages 4-43 to 4-44, found in its analysis that “many moderate to large streams on forested trust lands may have reduced levels of one or more riparian functions under current conditions because of low to moderate levels of large, fully functioning stands.” Overall, many riparian areas were found to be in early or mid-developmental stages, with very few riparian forests containing a complex stand structure.

The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Chapter 3, Section 3.4.2.3 Existing Conditions of Riparian Areas, pages 3-42 to 3-43, reports a similar pattern for Eastern Washington. A combined analysis of private and forested state trust lands found that a large proportion of riparian areas were in early seral stages (61 percent of sampled private and state lands), while only 5 percent were found to be in late seral stages that would fully provide for riparian functions, including the presence and viability of rare plant populations in riparian areas.

Additionally, Eastern Washington riparian areas are threatened by more intense and destructive wildfires due to dense understories, natural regeneration and presence of fire intolerant species (Wissmar et al., 1994) (*Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Chapter 3, Section 3.4.2.3 Existing Conditions of Riparian Areas, page 3-41).

REGULATORY FRAMEWORK

The state Forest Practices Rules regulate timber harvest and road construction in riparian areas across all non-federal ownerships in Washington. Timber harvest in riparian areas is regulated through the establishment of riparian management zones that consist of a 50-foot core zone and variable width inner and outer zone, based on site class and stream size. In Western Washington, management of riparian management zones must be consistent with desired future condition basal area targets, which are set by site class. In Eastern Washington, riparian management zone rules for fish bearing streams vary by habitat types – ponderosa pine, mixed conifer and high elevation timber type. In addition, special shade requirements apply in Eastern and Western Washington.

In Eastern Washington, state Forest Practices Rules currently do not protect many nonfish-bearing perennial streams (Type 4 waters) with a riparian management zone. Instead, Type 4 waters are afforded a 50-foot buffer in which the landowner must choose between a partial cut or clearcut strategy (see WAC 222-30-022). Under the clearcut option, up to 30 percent, or a maximum of 300 feet, of a stream reach within a harvest unit, can be removed. Nonfish-bearing perennial and seasonal streams are afforded a 30-foot equipment limitation zone to minimize ground disturbance to less than 10 percent.

The department's *Habitat Conservation Plan* exceeds state Forest Practices Rules in Western Washington and establishes riparian management zones equal to the site potential tree height at age 100 for Types 1-3 streams or at least 100 feet, and 100-foot riparian management zones for Type 4 streams. Type 5 streams are protected according to *Forest Resource Plan* Policy No. 20 which states, "when necessary for water quality, fisheries habitat, stream banks, wildlife, and other important elements of the aquatic system." The department is currently developing a long-term Type 5 strategy via the adaptive management process outlined in the *Habitat Conservation Plan*. The conservation objectives for riparian areas under the *Habitat Conservation Plan* are to maintain or restore salmonid freshwater habitat and to contribute to the conservation of other aquatic and riparian obligate species. Outside a 25-foot inner zone, forest management activities are allowed within the riparian management zone when they maintain or restore the quality of salmonid habitat. The department is also currently developing a Riparian Restoration Strategy to be approved by the Federal Services. This strategy will describe in detail the conservation objectives, as well as management and monitoring activities in riparian management zones on lands in Western Washington governed by the *Habitat Conservation Plan*.

Approximately 700,000 acres of forested state trust land in Eastern Washington (the East Cascades, Okanogan, Columbia Plateau and Canadian Rocky Mountains ecoregions) are managed under the state Forest Practices Rules and policies of the Board of Natural Resources. The regulatory minimums of the state Forest Practices Rules at the time of the *Habitat Conservation Plan* development were considered inconsistent with *Forest Resource Plan* Policy No. 20 (*Final Environmental Impact Statement for Habitat Conservation Plan*). The state Forest Practices Rules underwent a major revision in 2001 to protect Endangered Species Act listed aquatic species, to restore and maintain riparian habitat, to meet the federal Clean Water Act and to keep the timber industry economically viable.

Although several revisions of the state Forest Practices Rules affecting riparian area management have taken place for the eastside, riparian management zones are currently not required for many Type 4 and Type 5 waters. The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources* concluded that large woody debris recruitment, stream shade and leaf and litter production would be at moderate risk for Type 4 streams and at high risk for Type 5 streams. The risk along perennial nonfish-bearing streams (Type 4) is reduced due to the requirements for some tree retention within the first 50 feet on either side of the stream. The adverse effects to the riparian microclimate along nonfish-bearing streams are considered high to very high since even a 50-foot no-harvest buffer is at most one-third

of the minimum recommended buffer for the various microclimate variables. Particular concern exists over air temperatures and humidity, which affect amphibian habitats and stream temperatures that could be transferred to downstream fish streams.

The sustainable harvest level that was adopted by the Board of Natural Resources in September 2004 is modeled to be consistent with *Habitat Conservation Plan* requirements for riparian areas currently being finalized with the Federal Services for riparian management. Under the new sustainable harvest level, which applies only to forested state trust lands in Western Washington, a long-term average of 8 percent of riparian areas would receive enhancement activities per decade. This is within the anticipated long-term average of 10 percent per decade expressed by the Federal Services in their biological opinions on the *Habitat Conservation Plan*. On average, 6,200 acres of riparian areas in the Olympic Experimental State Forest and 26,600 acres in the five westside *Habitat Conservation Plan* planning units will receive restoration activities per decade. Table 4.3-2 in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (page 4-47) illustrates in more detail the estimated acres of forest management in riparian areas per decade for the Olympic Experimental State Forest and the five westside *Habitat Conservation Plan* planning units.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 was adopted to protect important environmental resources associated with streams and riparian areas, prior to the development of the *Habitat Conservation Plan* and existing state Forest Practices Rules. Alternative 1 currently provides a policy for riparian management zones along Type 1-4 waters and when necessary along Type 5 waters. Alternative 1 broadly expanded the protection of riparian areas from the pre-1992 requirements. It made the removal of timber secondary to the protection of fish habitat and other nontimber resources, such as water quality, wildlife habitat and sensitive plants, and required the department to prevent degradation of the riparian environment through forest management activities. Specifically, Alternative 1 expanded the protection to Type 4 and Type 5 waters, recognizing the value of nonfish-bearing streams to the aquatic ecosystem, and exceeded state Forest Practices Rules at that time. The department implemented Alternative 1 when it signed the *Habitat Conservation Plan* for 1.6 million acres of forested state trust lands in the range of the northern spotted owl. The Riparian Conservation Strategy of the *Habitat Conservation Plan* established riparian management zones along Type 1-4 waters in Western Washington, and management within the zones is guided by restoration objectives for salmonid and other riparian obligate species. For Type 5 waters, information at the time of signing the *Habitat Conservation Plan* was insufficient to determine “when necessary.” Therefore, a long-term strategy guiding Type 5 stream buffering is being developed within the first ten years of the *Habitat*

Conservation Plan. Alternative 1 does not appear to meet Policy Objectives 3 and 5 as well as Alternative 3.

POLICY STATEMENT

***Forest Resource Plan* Policy No. 20, Riparian Management Zones: “The department will establish riparian management zones along Type 1-4 waters and when necessary along Type 5 waters. The department will focus its efforts on protecting key non timber resources, such as water quality, fish, wildlife habitat and sensitive plant species.”**

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 assumes that compliance with state law, state Forest Practices Rules and the *Habitat Conservation Plan* meets or exceeds Alternative 1 and is adequate to address riparian management zones statewide. Alternative 2 does not appear to meet Policy Objectives 3 and 5 as well as Alternative 3.

POLICY STATEMENT

The *Habitat Conservation Plan* and existing laws governing riparian protection, such as the Forest Practices Act, the state Forest Practices Rules and the Hydraulics Act, will appropriately protect key non-timber resources, such as water quality, fish, wildlife habitat and sensitive plant species.

■ ALTERNATIVE 3 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 3 is very similar to Alternative 1, but contains updated terms for stream types, to be more consistent with the state Forest Practices Rules. Alternative 3 continues protection of key non-timber resources associated with riparian areas, including sensitive riparian plant species. Alternative 3 best meets the applicable policy objectives by directing the department to use professional judgment and best available science to exceed regulatory minimums to ensure ecological productivity of riparian areas (Policy Objective 5). In addition, Alternative 3 also uses updated terms for stream types consistent with current forest practices language, i.e., fish/non-fish, to provide clarity and consistency (Policy Objective 3).

POLICY STATEMENT

The department will establish riparian management zones along fish-bearing waters, perennial non-fish bearing waters, and when necessary, along seasonal non-fish bearing waters to protect key non-timber resources, such as water quality, fish, wildlife habitat and sensitive riparian plant species.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

A moderate to high risk of adverse impacts to several functions of Type 5 waters exists under Alternative 1, primarily in Eastern Washington. Alternative 1 has been implemented through the *Habitat Conservation Plan* on the westside. Under Alternative 1, the department retains 50-foot no-harvest buffers along Type 4 waters on the eastside in most cases. However, Alternative 1 lacks clear guidance when to protect Type 5 waters, which has led to inconsistent management approaches on all forested state trust lands. For the westside, it is anticipated that the Type 5 Conservation Strategy required under the *Habitat Conservation Plan* by 2007 will address this issue. Protection of Type 5 waters for the eastside is largely deferred to a regulatory adaptive management process, under the guidance of the Cooperative Monitoring, Evaluation and Research Committee, which will conduct validation and effectiveness monitoring and research to facilitate achieving the resource objectives for “aquatic resources” (*Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, page 2-32).

Most of the rare plant species that occur along or within forested riparian areas have somewhat of a clumped distribution, rather than being evenly distributed along the riparian zone. They also tend to be specific to a relatively narrow range of stream types. That is, a given rare plant species that occurs in Type 5 waters may also occur in Type 4 waters, but is less likely to occur in Type 1, 2 or 3 waters. Appropriate placement of and management within riparian management zones has the potential to accommodate most of the conservation needs of rare riparian plant species. Those plant species limited in their occurrence to Type 5 waters are at greatest risk, due to the lack of clarity regarding when riparian management zones will be established along them.

There is an increased likelihood of adverse impacts to riparian areas in Eastern Washington under Alternative 2. As stated in Alternative 2, the *Habitat Conservation Plan* provides protection of riparian functions in Western Washington. The 2001 update of the state Forest Practices Rules, which apply to forested state trust lands on the eastside, provides protection for most riparian functions. Some concern remains, however, for eastside riparian areas. The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources* points out that “Overall [the state Forest Practices Rules] appears to provide adequate protection for most riparian functions except for those along many small streams which have no riparian management zones. In general, the risk of inadequate protection of riparian function appears to be higher for the eastside.” A discussion of this analysis is hereby incorporated by reference: *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Summary, pages S-9 to S-14, and Chapter 3, pages 3-50 to 3-88. In particular, Type 5 streams and the portion of Type 4 stream reaches clearcut under the clearcut strategy in the state Forest Practices Rules are at greatest risk of shade loss, interruption of detrital inputs and sediment delivery. The risk of diminished large woody debris recruitment is moderate to potentially high along all stream types, fish and nonfish-bearing. These risks are further elevated in watersheds that are already degraded. Recent research indicates that nonfish-bearing headwater streams play an important role for downstream habitat (Wipfli, 2001).

The complete impact of insufficient large woody debris recruitment, leaf/needle litter recruitment and shade and microclimate along small nonfish-bearing streams on downstream fish habitat is still unknown. A discussion of this is incorporated by reference from the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, page S-11. The establishment of riparian management zones, however, is generally accepted as the most effective way to protect aquatic and riparian habitats.

Appropriate placement of and management within riparian management zones has the potential to accommodate most of the conservation needs of rare riparian plant species. Those plant species limited in their occurrence to Type 4 and Type 5 waters are at greatest risk in Eastern Washington, due to the clearcutting potential in Eastern Washington under existing state Forest Practices Rules.

The analysis for Alternative 3 is identical to the analysis for Alternative 1. However, Alternative 3 better meets Policy Objective 3 by providing clarity and consistency with current Forest Practices terminology.

CUMULATIVE IMPACTS

The potential for significant adverse cumulative impacts to instream and riparian habitat is related to current conditions, the intensity and type of future forest management in riparian areas and the risk associated with upslope activities on unstable slopes that could result in large mass movements.

Cumulative impacts are generally addressed through the establishment of minimum standards for all forest practices. A discussion of this is incorporated by reference from the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Chapter 3, pages 3-207 to 3-216. Additional rules, such as those dealing with Class IV-Special applications or road maintenance and abandonment plans, further address cumulative impacts. These rules are particularly important in regard to cumulative adverse effects on riparian habitat, since sediment is the primary pollutant associated with forest management activities. In addition, the potential for cumulative impacts is assessed at multiple levels of implementing Board of Natural Resources' policies through integration with SEPA reviews during planning and site-specific project proposals.

Under all alternatives, riparian management zones on the westside will be managed under the Riparian Forest Restoration Strategies, an adaptive management plan approved by the Federal Services under the *Habitat Conservation Plan*, which generally proposes moderate intensity levels of thinning outside a 25-foot no-harvest zone for riparian forest restoration. Type 5 streams will have a *Habitat Conservation Plan* conservation strategy by 2007. Therefore, the risk of adverse cumulative impacts from ground disturbance and tree removal is low and will be addressed through the adaptive management process, through the SEPA review process on the Riparian Forest Restoration Strategy and on a project-by-project basis.

Under Alternative 2, there is an increased risk of an adverse cumulative impact regarding the effects of the lack of riparian management zone buffers on many nonfish-bearing

streams on the eastside, because cumulative impacts may not be addressed, particularly in watersheds with a high level of recent past harvest. The uncertainty relates to issues regarding effects on sediment delivery to fish streams, large woody debris and leaf/needle litter recruitment from non-fish to fish streams, and the effects of shade reduction and microclimate changes on non-fish stream temperatures and their ultimate effect on fish stream temperatures. A discussion of this is incorporated by reference from the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Summary, pages S-9 to S-14, Chapter 3, pages 3-7 to 3-89, 3-106 to 3-116, 3-143 to 3-174, and 3-207 to 3-216.

Although Alternatives 1 and 3 provide for Riparian Management Zones along nonfish seasonal streams where necessary to protect key nontimber resources, the lack of criteria increases the risk of adverse cumulative impacts to key nontimber resources described above.

The cumulative impacts on riparian rare plant species occurring within or along Type 1 through Type 3 waters are similar for all alternatives. However, riparian rare plant species occurring along Type 4 and 5 waters in Eastern Washington and Type 5 waters in Western Washington are at greater risk of cumulative impacts under Alternative 2. This increased risk is mitigated under Alternatives 1 and 3, because of their emphasis on using riparian management zones, including all Type 4 waters and Type 5 waters when necessary, to protect various features and/or functions, including riparian rare plant species. However, similar to Alternatives 1 and 3 for other key nontimber resources, the lack of criteria for determining “when necessary” increases the risk of adverse cumulative impacts to riparian plant species.

3.2.9 Wetlands

INTRODUCTION

Wetlands are defined by state Forest Practices Rules (WAC 222-16-010) as:

“ ... those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, such as swamps, bogs, fens and similar areas. This includes wetlands created, restored, or enhanced as part of a mitigation procedure. This does not include constructed wetlands or the following surface waters of the state intentionally constructed from wetland sites: irrigation and drainage ditches, grass lined swales, canals, agricultural detention facilities, farm ponds and landscape amenities.”

Wetlands provide vitally important hydrologic and habitat functions that play a role across the landscape in all ecoregions of Washington State, influencing ecosystems far beyond their specific boundaries. Wetlands support populations of wildlife, including fish, birds, reptiles, amphibians and invertebrates; enhance downstream ecosystems, including fish habitat through their water quality functions; and mitigate effects of flood events. The department recognized the important role wetlands play in forest land health since 1992, when *Forest Resource Plan* Policy No. 21 was adopted.

The state Forest Practices Rules further define wetland functions to “include the protection of water quality and quantity, providing fish and wildlife habitat and the production of timber.” Protection of wetland acreage and function is an integral part of the *Habitat Conservation Plan*’s riparian strategy.

The following Policy Objective applies to this policy subject area:

- Ensure policies are succinct, relevant and easily understood by the public and department employees (Policy Objective 3).

AFFECTED ENVIRONMENT

This subsection incorporates a discussion of the following elements of the affected environment related to the healthy functioning of wetlands: soils, surface water and groundwater exchange, runoff and floodwater behavior, water quality, plants, animals and habitat.

Wetlands are characterized by a high diversity, density and productivity of both plant and animal species. They provide some of the most important fish and wildlife habitat in forest lands. Wetlands are areas where water saturates or floods the soils for long enough during the growing season to develop an anaerobic rooting zone, excluding plants that are not adapted to life in saturated soils. Wetland habitats in forested landscapes include freshwater marshes, swamps, bogs, fens, seeps, wet meadows and shallow ponds. Wetlands can be forested or dominated by shrubs, herbs, mosses, grasses or grass-like plants. They may be isolated from other surface waters or associated with surface water

bodies, such as ponds, lakes, rivers and streams. Maintaining the hydrologic functions of wetlands and riparian areas is essential to maintaining the health and function of the entire aquatic ecosystem and contributes to the health of upland ecosystems as well. Since European colonization, it is estimated that 30 to 50 percent of wetland acreage in Washington State has been lost due to human activity (National Wetlands Inventory, United States Fish and Wildlife Services, 1999). On forested landscapes, wetland losses are very difficult to track. The department's inventory capability has been limited to aerial photo interpretation, which typically underestimates forested wetlands. It is assumed that losses of forested wetlands and their ecological functions are related primarily to timber harvest and associated activities. Climate, substrate and landforms influence the extent and types of wetlands found in different parts of Washington and general patterns can be observed over the nine ecoregions that occur in the state.

In Western Washington, generally high rainfall and soils that commonly have soil horizons that restrict water movement give rise to a great many forested wetlands, marshes, shrub dominated and riparian wetlands. Bogs, while generally rare on the landscape, are relatively more common in the Northwest Coast ecoregion than in other parts of Western Washington, because of its geological and glacial history. The Puget Trough ecoregion experiences less rainfall than other parts of Western Washington, but includes many wetlands of similar character to those in the other westside ecoregions, due in part to the impermeability of some soils derived from glacial till and outwash. In the North Cascades and West Cascades ecoregions, sharp topographic relief, dissected terrain, high elevations and glacially derived landforms shape a variety of wetlands, from high elevation glacial lakes and alpine wet meadows, to lower elevation forested and riparian wetlands.

In the forested portions of the East Cascades, Okanogan, Canadian Rocky Mountains, Columbia Plateau and Blue Mountains ecoregions, the climate, soils and topography dictate a different landscape for wetlands than is found in Western Washington. Cold, snowy winters with snow pack forming in higher elevations and hot, dry summers give rise to vernal pools, riparian wetlands, groundwater fed basins and occasional bogs and fens. In comparison to Western Washington, forested wetlands are less frequently observed and provide a stark contrast to forested uplands. Wetlands east of the Cascade Mountain crest are important water sources. These fragile habitats are dependent on surrounding forests to insulate them from ambient temperature extremes. Because of the more continental climate in Eastern Washington, wetland hydrology is more susceptible to both domestic and wild animal grazing and timber harvest impacts than many of their westside counterparts.

Because wetlands vary in hydrology, soils, vegetation, size and position on the landscape, they also vary considerably in the types of functions they perform and the degree to which they perform them.

A majority of the terrestrial vertebrate species in Washington depend on wetlands for their habitat needs, either seasonally or for some portion of their life cycle. Seventy-seven percent of inland bird species that breed in Washington and Oregon nest in wetland and riparian areas and 65 percent of Washington and Oregon's mammal species use riparian

or wetland habitats (Johnson and O'Neil, 2001). Some wetlands provide over-wintering habitat for fish species and many wetlands influence downstream water quality in ways that help maintain fish habitat in streams and rivers. Hydrologic functions of wetlands include providing sites for groundwater exchange (recharge at some locations and discharge at others), storm water detention and seasonal stream flow augmentation.

Wetlands contribute to maintaining water quality through sediment trapping, including removal and transformation of nutrients, such as nitrate and phosphorus, and toxicants, such as pesticides and heavy metals. Wetlands cycle and export nutrients, produce and store or export organic carbon and provide fuel in the form of periphyton for downstream ecosystem productivity, supporting food webs for aquatic life, including fish.

For further discussion of wetland functions and values on state lands in Washington, please refer to the discussion incorporated here by reference in the following documents: the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, page 3-90; the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, page 4-96; and the *Final Environmental Impact Statement Habitat Conservation Plan*, page 4-175 to 176.

Timber harvest and associated road building activities in wetlands can have various impacts on wetlands and their functions. Removal of trees and other vegetation can result in hydrologic changes, including a raised water table. Alteration of the water table can change local floodwater behavior and increase runoff. Vegetation changes due to water table changes also alter habitat features in wetlands causing varying effects depending on the species involved. In addition, water temperatures can be raised by removal of shading canopies.

Soil impacts, such as rutting or compaction, within wetlands or in the adjacent uplands can result in decreased infiltration and/or channelization and associated diversion or alteration of flow, e.g., transforming subsurface flow to surface flow. Soil disturbance due to harvesting and road building can also result in sedimentation, with associated water quality being degraded both locally and in downstream ecosystems. For a discussion of possible impacts to wetlands due to timber harvest and road building activities, see the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management on State Trust Lands in Western Washington*, page 4-97.

Estimates of wetland acreage in Washington are based primarily on the National Wetlands Inventory, which was conducted in the 1970s and 1980s by the United States Fish and Wildlife Service, using stereoscopic analysis of aerial photos to identify and classify wetlands. Most of the wetlands identified through National Wetlands Inventory were not field verified. The National Wetlands Inventory is believed to have underestimated forested wetlands and very small wetlands, due to the limitations inherent in aerial photo interpretation and the difficulty of identifying wetland vegetation through forest canopies. A second data source for classifying land types is the department's Forest Resource Inventory System. Like the National Wetlands Inventory, the Forest Resource Inventory System is based on aerial photo analysis and has been field verified to varying degrees. Unlike National Wetlands Inventory, the Forest Resource Inventory System was

never intended as a means to identify wetland areas, which strongly limits its utility in this respect.

REGULATORY FRAMEWORK

Wetlands are protected at the federal level through section 404 of the Clean Water Act (33 U.S.C. sec. 1251 et seq.), which requires a federal permit for discharge of dredge spoil or fill material into wetlands. However, section 404(f)(1) provides an exemption for normal agricultural, ranching and silvicultural activities, as well as maintenance of existing drains, farm ponds and roads.

The department's commitment to wetland conservation is built on a policy of "no overall net loss of naturally occurring wetland acreage or function" (*Forest Resource Plan Policy No. 21*). This policy emphasizes avoiding the loss of wetlands and requires mitigation if loss occurs.

On the westside of the Cascade crest, the *Habitat Conservation Plan's* riparian strategy provides protection for all wetlands greater than one-quarter of an acre on state land through managed buffers designed to maintain hydrologic functions. The *Habitat Conservation Plan* requires an average minimum of 120 square feet of residual basal area in forested wetlands and all wetland buffers. This is designed to maintain at least 95 percent of natural potential evapotranspiration to protect the hydrology of the wetland, as described in the *Habitat Conservation Plan*.

The state Forest Practices Rules regulate timber harvesting and road building activities in and around wetlands on all state and private forest lands in Washington. The state Forest Practices Rules define wetland management zones as managed buffers, which provide wildlife benefits for non-forested wetlands greater than one-quarter of an acre. Wetland management zones may encompass adjacent forested wetlands as part of the required buffers. Limited operations and operational restrictions are required in forested wetlands. The state Forest Practices Rules do not require wetland management zones or leave trees on forested wetlands, although landowners are encouraged to clump leave trees within wetlands. Timber harvest, however, is prohibited within 50 feet of headwater and sideslope perennial seeps and most riparian wetlands would receive protection through riparian management zones. Under the state Forest Practices Rules, the basal area that would be represented by the minimum number and size of leave trees required in wetland management zones is 38.7 square feet per acre for Western Washington and 34.4 square feet per acre for Eastern Washington.

Neither the state Forest Practices Rules nor the *Habitat Conservation Plan* provide protection for isolated wetlands less than one-quarter acre. This may be inconsistent with *Forest Resource Plan Policy No. 21*, which requires no overall net loss of function or acreage.

The department is currently unable to assess whether or not the intent in Policy No. 21 of no net loss is fulfilled by either the state Forest Practices Rules or the *Habitat Conservation Plan* for wetlands greater than one-quarter acre, because there isn't an existing system for tracking wetland losses and impacts. Thus, losses cannot be

documented. While it is probable that the *Habitat Conservation Plan* meets the intent of Policy No. 21 for westside wetlands greater than one-quarter acre, the state Forest Practices Rules probably do not meet policy intent for eastside wetlands. This is because many forested wetlands have no buffer requirement and the minimum residual basal area represented by minimum leave tree requirements within wetland management zones is very low, in comparison to the basal area requirements of the *Habitat Conservation Plan*, as described above.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 creates a no net loss standard. Alternative 1 recognizes that some temporary loss of function may occur in the course of forest management activities, but requires the department to restore the wetlands or acquire a sufficient amount of new wetlands to avoid overall net loss of naturally-occurring wetlands on forested state trust lands.

Alternative 1 emphasizes avoiding the loss of wetlands and allows for mitigation if loss occurs. If mitigation is necessary, preference is given to on-site and in-kind replacement of acreage and function. Alternative 1 focuses on naturally occurring wetlands, suggesting that “artificially created” wetlands are not subject to Alternative 1. This focus may not meet the intent of the *Habitat Conservation Plan* and does not reflect the requirements of the current state Forest Practices Rules. Alternative 1 does not appear to meet Policy Objective 3 as well as Alternative 2.

POLICY STATEMENT

Forest Resource Plan Policy No. 21, Wetlands: “The department will allow no overall net loss of naturally occurring wetland acreage and function.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 creates a more extensive no net loss standard. Alternative 2 applies to wetlands as defined in the state Forest Practices Rules, specifically including wetlands created inadvertently through past forest management activities that meet the state Forest Practices Rules definition. Alternative 2 recognizes that some loss of function may occur in the course of forest management activities and it requires the department to restore or replace the wetlands, requiring no net loss of wetlands on forested state trust lands. This policy emphasizes avoiding the loss of wetlands and allows for mitigation if loss occurs. If mitigation is necessary, preference will be given to on-site and in-kind replacement of acreage and function. Alternative 2 better meets the intent of the *Habitat Conservation Plan* and is consistent with current state Forest Practices Rules. Alternative 2 best meets the applicable policy objective as it updates and clarifies the policy to be compliant and consistent with state Forest Practices Rules and the intent of the *Habitat Conservation*

Plan by removing the word “overall” and “naturally” from the policy statement and adding “as defined by state Forest Practices Rules” (Policy Objective 3).

POLICY STATEMENT

The department will allow no net loss of acreage and function of wetlands as defined by state Forest Practices Rules.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

There is an increased risk of adverse impacts to constructed wetlands and wetlands inadvertently created as a result of past management practices under Alternative 1. As stated in the policy discussion, Alternative 1 limits protection to those wetlands that are “naturally occurring.” This puts the policy in conflict with the state Forest Practices Rules, which use a broader definition of wetlands, including constructed wetlands created as part of mitigation plans, wetlands inadvertently created as a result of past management practices and other wetlands that meet the ecological criteria in the definition. Because the *Habitat Conservation Plan* also bases its wetland strategy on the definition in the state Forest Practices Rules, Alternative 1 is also in conflict with the *Habitat Conservation Plan* and in turn with Policy Objective 1.

Many wetlands on state land have appeared as a result of past management activities that altered hydrology. An example of this might be where road building obstructed sub-surface flow and subsequently forced water to the surface, creating a wetland. Many of these areas are now decades old and provide many habitat, water quality and hydrologic functions. These wetlands require the same protection as “naturally occurring” wetlands, because of their functional contributions and because they may partly offset the negative effects of historic wetland loss. Such wetlands may not be protected through Alternative 1.

No significant adverse impacts have been identified under Alternative 2. Alternative 2 is adequately aligned with the state Forest Practices Rules, the intent of the *Habitat Conservation Plan* and Policy Objective 1, because it defines wetlands using the definition in the state Forest Practices Rules. This definition includes wetlands that may not have been specifically protected through Alternative 1. Wetland acreage and function of wetlands that meet the definition in the state Forest Practices Rules are protected, regardless of wetland size, and mitigation is required to address any losses of function or acreage. The preference for on-site and in-kind mitigation means that wetland losses must be rectified when possible within the same sub-basin where the loss has occurred. This mitigation should replace the same wetland functions and acreage as were lost. For instance, a forested wetland must be replaced by a forested wetland, not by an emergent or shrub-dominated wetland.

The word “overall” in Alternative 1 was originally intended to be inclusive of all wetlands on forested state trust lands, implying that the permanent loss of state-managed wetlands could be mitigated by the creation or purchase of additional wetlands. In Alternative 2, the term “net” should be viewed as inclusive of all wetlands on state trust lands. The term “overall” is not needed, as it would be redundant.

CUMULATIVE IMPACTS

If applied strictly as written, Alternative 1 could result in significant cumulative impacts to wetlands, wetland-dependent wildlife, hydric soils, wetland plants and downstream hydrologic systems, through the lack of protection of wetlands that are not considered “naturally occurring.”

There are no cumulative impacts associated with Alternative 2, except where wetlands under a quarter of an acre are not protected, as outlined in the Affected Environment subsection for this policy subject area (i.e., protection of wetlands less than one-quarter acre in size and the minimum residual basal area represented by minimum state Forest Practices Rules leave tree requirements within wetland management zones and riparian management zones in Eastern Washington). However, wetlands less than a quarter of an acre in size are often protected through the department’s leave tree strategies and other operational activities.

3.3 Social and Cultural Benefits

This major policy category contains policy subject areas related to social and cultural benefits that are provided from forested state trust lands and through the department's management activities. Forested state trust lands play an important role in providing opportunities for public access and recreation; protecting areas of cultural concern; preserving the visual integrity of Washington's forested landscapes; as well as contributing to local, regional and state economies.

3.3.1 Public Access and Recreation

INTRODUCTION

The department provides public access opportunities on forested state trust lands as directed by the Multiple Use Concept (RCW 79.10.100), as long as these opportunities are consistent with trust objectives. There are substantial public expectations for public access and recreation, which are not always compatible with a managed landscape. Recreation on forested state trust lands is diverse. Such uses can and do occur in both a dispersed or concentrated way and, in some cases, are supported by developed facilities, such as campgrounds, trailheads and trails. Population growth has greatly increased the demand for access and recreation, as well as increased the incidents of public abuse and illegal activities. At the same time as this demand and level of activities has increased, funding to provide multiple use opportunities from the State-General Fund and a variety of grant programs has decreased.

The following Policy Objectives apply to this policy subject area:

- Meet all state and federal laws, including the trust obligations and the contractual commitments of the *Habitat Conservation Plan* (Policy Objective 1); and
- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2).

AFFECTED ENVIRONMENT

The department provides recreation and public access opportunities across 2.1 million acres of forested state trust lands. Every year hikers, hunters, trail riders, campers and others who enjoy recreating outdoors make more than nine million visits to department-managed lands. Recreation on department lands tends to be dispersed and emphasizes trails. Activities also include low impact education-centered recreational opportunities. Much recreation takes place in forest settings supported by primitive facilities.

Department ownership patterns influence the accessibility of the land to the state's population. Lands managed by the department in Western Washington have been for the most part aggregated in large blocks. Much of the land also lies in low to middle

elevations, making it accessible for most, if not all, of the year. Areas such as the Capitol State Forest at more than 93,000 acres and the Tahuya State Forest at 23,000 acres provide large landscapes for public access. The high rainfall, especially in the fall, winter and spring, means that recreation facilities require constant maintenance to remove overgrowing vegetation and stabilize soils against erosion.

The geographic locations of forested state trust lands are, in many instances, between high density urban or urbanizing areas and higher elevation federal lands. This tends to increase their accessibility to the major population centers of the state. Surveys have shown that the number of people accessing state trust lands has grown as population has increased. This is especially true in Western Washington because of the short travel distances from major cities and towns. In some locations, local support for recreational activities on forested state trust lands provides a significant contribution to local economies.

Recreation use in Eastern Washington is also concentrated in larger blocks of land, such as the Loomis State Forest which, at 134,000 acres, is the largest contiguous block of forested state trust land managed by the department. Eastern Washington forests are generally more open with less dense understory vegetation, providing more opportunities for dispersed recreation activities. Lower rainfall and higher snowfall allow recreation in winter, such as snowmobiling and cross-country skiing. Vegetation management along trails is less of a concern. High snowfall can close or restrict use in some areas because of access difficulty.

Recreation opportunities are also long distances from population centers. This favors “destination-site” activities that include camping or staying in vacation facilities close to forest lands. Dispersed activities, especially hunting, are popular and the high temperatures of the summer months tend to push recreation to sites with water access. Most dispersed activities occur from a campsite or recreational vehicle parked within a developed recreation area or a clearing in the forest.

As of 2004, the department’s Recreation Program includes 143 recreational sites and more than 1,100 miles of trails statewide. Of the sites, 57 percent are campgrounds and 43 percent are day-use facilities (trailheads, picnic areas, boat launches and/or interpretive areas). Additionally, there are countless dispersed opportunities, including an unknown amount of user-built trails. In addition to campgrounds, picnic areas and trails, the department provides considerable public access along its 12,000 miles of forest roads. See the Roads policy subject area for a full discussion of the alternatives being considered for roads.

The department hosts a broad range of opportunities, including but not limited to: hunting, fishing, camping, equestrian use, motorcycle and all-terrain vehicle riding, hiking, mountain biking, camping, 4 x 4 riding, educational field tours, boating and sightseeing. Facilities that the department manages to support recreational access include: day-use areas with picnic sites and group shelter areas, primitive camping, interpretative centers/nature centers, trailheads, boat ramps and/or docks and public beach access sites. However, most recreation on forested state trust lands occurs on trails and roads.

The department manages more than 1,100 miles of trails. Of these miles, more than 450 miles are multiple-use non-motorized trails, more than 120 miles are hiking only trails and almost 200 miles are winter trails for snowmobiles and cross-country skiing. As demand for different uses increases, conflicts between different types of recreation and users may increase as well, making multiple use trail systems more difficult. Many more miles of trails have been built by the users themselves that are not designated or managed by the department. With more than 400 miles of designated motorized trails, the department is the largest state provider of off-road vehicle trail riding opportunities in Washington.

A typical developed recreation site could include a variety of improvements and facilities. Camping and day-use areas can include tables, fire pits and vault toilets; improved paths and fencing; directional, interpretive or other signs; horse corrals; water systems; semi-permanent host sites, including utilities hook-up; some limited garbage collection facilities and other ancillary improvements. Trails often include areas hardened with concrete blocks or timbers, bridges with hardened approaches, signage systems, improved parking areas that are graveled or paved and trails within maintained vegetation-free corridors.

Developed sites are found on forest edges and deep within managed forest areas. Trails typically include loops that traverse a variety of forest stand types and elevations. While most of the recreation activity is concentrated in larger forest blocks, even a small parcel of land may be used as a favorite hunting or fishing area or may contain sport trails frequented by a local neighborhood or community.

Department-designated and financially or otherwise (volunteers) supported facilities such as campgrounds, trailheads, boat launches, roads and trails are designed, located and managed to mitigate potential environmental impacts to earth, water, wildlife and the built environment. Examples include: locating facilities away from streams and wetlands and on flat or gently sloping surfaces; maintaining as much natural vegetation as possible during construction; limiting or completing closures during the wet season; use of drainage structures, bridges and surface hardening; and avoidance of special ecological features or wildlife habitats.

The focus of maintenance activities on recreation sites and trails is to minimize potential impacts to soils. The department has and continues to relocate trails on soils and terrain that are more stable, have good drainage and are less steep. Management activities focus on stabilizing soil through installation of drainage structures, such as ditches and water bars; use of trail hardening materials in areas prone to erosion, such as curves, slopes and approaches to bridges over streams; and imposing seasonal closures of trail segments or systems when rain and snowfall is likely to be highest.

Incompatible dispersed public use of forested state trust lands represent the highest potential for environmental and public safety impacts. Many user-built trails are not located or designed to mitigate potential environmental impacts nor are they supported financially or otherwise. These trails have no drainage structures, are often located on

erodible soils or steep slopes, have wet crossings of streams (no bridges) and are used during times of the year when impacts can be most severe.

Noise concerns associated with both authorized and unauthorized public uses, especially associated with off-road motor vehicles and recreational shooting are increasing. Such uses in some locations, especially if unmanaged, produce significant noise level impacts to surrounding residential areas. Moreover, concentrated and dispersed target shooting, which has increased significantly during the last decade on forested state trust lands, also pose an increased safety risk to the public and department employees.

Existing funding for the Recreation Program has declined in terms of real dollars over the past decade. In terms of resources for maintenance and management of facilities and trails, the department has experienced a decline in the capacity to assess and mitigate potential risks to humans and the environment. Only about 30 percent of existing sites are maintained on a regular basis, with the rest receiving intermittent to very little attention. The result is that most of the department's developed and designated areas have infrequent garbage collection, vault toilets are pumped irregularly and vandalism or storm damage is not immediately repaired. Due to dwindling resources for public use management, risks of environmental impact cannot always be addressed in a timely manner. While the department uses all its resources in the most effective way possible by seeking grant and other external funding sources and by leveraging staff capacity with adopt-a-trail and other volunteer-based programs, the need for management is greater than the present capacity to deliver it.

Volunteers are a vital component of the department's Recreation Program and assist in a variety of ways. They provide support for grant applications, primarily for site and trail maintenance funding. Volunteers also actively participate in trail and facility maintenance activities, such as brushing trails, forest watch, hardening and shaping trails, installing culverts and drainage dips, assisting with bridge construction and bridge maintenance, picking-up garbage, repairing fencing, weed control and painting outhouses and signs. Volunteers also work as campground hosts. In 2004, the department's Recreation Program benefited from more than 12,000 hours of volunteer labor. The level of authorized recreation and public access that the department can provide and manage is dependent on the department's resources, staff time, other support and funding to maintain and manage the program.

Providing access for recreation can have an impact on the department's road system. Recreational visitors are dependent on the road system that the department builds and maintains for timber harvest and other land management activities. Except where state and local roads provide additional access, many recreational sites and trail systems can only be accessed from forest roads. The increased use created by recreational visitors can cause wear and tear on road surfaces and increase the amount of maintenance needed to meet public safety and environmental concerns. Vehicles driven by people seeking to access recreation sites can be two- or four-wheel, but are generally passenger cars, light trucks or sport utility vehicles. The quantity of vehicle trips for recreational access can represent an increased risk of degradation of the road system.

Road closures, particularly during rainy times of the year can help reduce maintenance needs. Paving road segments at greater risk of high use can also reduce the long-term maintenance needs, though initial costs of road construction can be much higher.

Public engagement in recreation activities can increase the need for public services, such as law enforcement, emergency medical resources and search and rescue activities. Activities associated with recreation can include potential risk of harm to the individual participating in the activity and those around them. Motorized activities are likely to include the greatest risk of bodily harm and often require the attention and time of law enforcement personnel to encourage safe operation of recreational vehicles. As the number of uses and users increases, so does the demand for enforcement and other services.

One consequence of managing a very large land base is the risk of illegal activities being carried out in areas not frequented or patrolled by enforcement or other personnel. With thousands of miles of forest roads and hundreds of entry points, the department is at high risk for illegal activities to occur. Some of those activities may also pose risks to the natural environment and other resources. Common illegal activities that occur include garbage dumping, vandalism, reckless shooting and theft of wood or other forest products. These create impacts to natural resources. Some activities, such as methamphetamine labs, can pose extreme danger to people and the environment. These are some of a wide variety of illegal practices that take place on department lands. The potential for impacts from these activities is difficult to anticipate. In order to minimize the risk of these impacts, the department would have to restrict access to the forested state trust lands and greatly increase the amount of enforcement presence across the landscape. This would result in greatly limiting public access and recreational opportunities for the vast majority of law-abiding people.

The state's population has doubled since 1950 and it is expected to double again by 2050. As a result, recreation demand is on the rise. According to the State Comprehensive Outdoor Recreation Plan (IAC, 2002):

- ORV use is expected to increase by 20 percent over the next 20 years, and, the amount of available ORV trails is expected to stay static;
- Equestrian use is expected to grow by 29 percent over the next 20 years; and
- Hiking use is expected to grow by 34 percent over the next 20 years.

Recreation activities affect the economics of Washington State. For example:

- According to the study, "Adding it up – Washington communities profit from fish, wildlife recreation" (Washington State Department of Fish and Wildlife, 2002), people in Washington State spend more than \$2 billion dollars annually for hunting, fishing and viewing wildlife.
- The motorcycle and all-terrain vehicle industry is growing rapidly. The people purchasing these vehicles will be looking for places to ride them. In many cases, they will seek out trails on forested state trust lands.

The demand for recreation on forested state trust lands in the future will very likely reflect these trends. Pressure from the public for more access and opportunities will continue to increase. In addition, the level of abuse and illegal activities has also risen dramatically since 1992. User built trails, theft, meth labs and marijuana plantations on forested state trust lands potentially damage the environment, take revenue away from the trusts and puts public and employee health and safety at risk.

REGULATORY FRAMEWORK

Chapter 79.10 RCW directs the department to allow multiple use of the trust lands it manages, including recreation areas and trails; education and scientific studies; special events; hunting and fishing; and maintenance of scenic areas and historic sites, when such uses are compatible with trust land management. Chapter 46.09 RCW applies to the permission necessary to enter upon private lands, including forested state trust lands, and sets standards for the permitting and use of off-road and non-highway vehicles. It does not apply to the use of snowmobiles or any vehicle designed primarily for travel on, over or in the water. Chapter 332-52 WAC, Managed Lands and Roads-Use Of, controls public use activities that occur on all lands under the jurisdiction of the department. The rules are aimed at protecting recreational, economic and industrial activities on land and roads.

Chapter 4.24 RCW limits the liability of the department from unintentional injuries suffered by anyone recreating on department-managed lands, as long as the department does not charge a fee for public access and recreation.

ALTERNATIVES

Table 4: Summary of Alternatives for Public Access and Recreation		
Alternatives	Approach	Emphasis
Alternative 1 (No Action)	Passive	Compatibility Not Adequately Addressed
Alternative 2	Active Control	Ensure Compatibility by Closing, Limiting and Restricting Access
Alternative 3	Active Collaboration	Ensure Compatibility through Collaboration and Increased Funding
Alternative 4 (Department's Recommendation)	Active Evaluation and Management	Ensure Compatibility through Evaluation, Active Management and Collaboration

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 commits the department to provide public access and recreation as required by the Multiple Use Concept, when compatible with the policies in the *Forest Resource Plan* and trust objectives. Alternative 1 states that the department may, in some circumstances, control access and recreation when necessary to accomplish specific management objectives, protect public safety or to control environmental impacts. Alternative 1 does not provide adequate guidance related to compatibility with trust objectives, given current or future demands for public access and recreation on forested state trust lands. Alternative 1 meets Policy Objective 1, but it does not appear to meet Policy Objective 2 as well as other alternatives.

POLICY STATEMENTS

Forest Resource Plan Policy No. 25, Providing Public Access: “The department will provide public access for multiple uses on state forest lands. In certain circumstances the department will control vehicular or other access, but only where necessary to accomplish specific management objectives. Public access may be closed, restricted or limited to protect public safety; to prevent theft, vandalism and garbage dumping; to protect soils, water quality, plants and animals; or to meet other objectives identified in the plan.”

Forest Resource Plan Policy No. 29, Recreation on State Forest Lands: “The department will allow recreation on state forest land when compatible with the objectives of the *Forest Resource Plan*. As part of its efforts, the department will continue to comply with the Statewide Comprehensive Outdoor Recreation Plan.”

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 emphasizes limiting, restricting or closing public access to address any negative impacts, the requirement for adequate non-management fund financed support and to ensure safety and compatibility with trust objectives, including environmental stewardship. Alternative 2 describes the actions the department will take to ensure safety and compatibility with trust objectives. Alternative 2 limits expenditures of management funds to control incompatible dispersed public access and illegal activities to meet trust objectives and protect trust assets. *Forest Resource Plan Policy Nos. 25 and 29* would be modified under Alternative 2.

Alternative 2 requires adequate non-management fund financed support for public access and recreation on forested state trust lands. If resources and funding are not available for safe, positive experiences for the public, and environmental and economic impacts cannot be minimized, access and recreation would be restricted or limited to the level that is compatible with public safety and trust objectives. This is a more active approach to

managing recreational access and allows for activities to be redirected or discontinued if impacts unacceptable to the trusts or the public occur. It is also, however, a more passive approach to pursuing funding to help support recreation on forested state trust lands and implement the Multiple Use Concept. Alternative 2 appears to meet Policy Objective 1, but does not appear to meet Policy Objective 2 as well as Alternatives 3 and 4.

POLICY STATEMENTS

When managing public access and recreation use on forested state trust lands, the department will seek to balance economic, ecological and social concerns, with a general emphasis on ensuring minimal ecological and economic impacts to the trusts, and positive, safe experiences for the public.

When designated or dispersed public access and use on forested state trust lands are resulting in threats to public, employee and department contractor safety; in theft, vandalism, garbage dumping and other illegal activities; or in damage to soils, water quality, plants and animals or other elements of the forest environment, the department will work to control those negative effects, including closing, limiting or restricting public access when necessary.

The department will limit expenditures of management funds to the closing, limiting or restricting of public access to control the impacts of incompatible dispersed public access and illegal activities to meet trust objectives and protect trust assets.

■ ALTERNATIVE 3

DISCUSSION

Alternative 3 emphasizes enhancing the compatibility of increased public access and recreation with trust objectives and public safety. Alternative 3 focuses on collaboration with the public, user groups, other landowners, other agencies and organizations to seek funding to ensure compatibility, as well as mitigate any negative impacts associated with incompatible dispersed public access. Management funds would be invested under Alternative 3 to control the impacts of incompatible public access. Management funds would also be invested where benefits, including financial, to the trusts can be demonstrated. Such benefits could include reducing management costs to the trusts in the short and long-term, as well as investing in public access and recreation as a financial diversification strategy to increase net revenues to the trust beneficiaries.

POLICY STATEMENTS

When managing public access and recreation use on forested state trust lands, the department will seek to balance economic, ecological and social concerns, with a general emphasis on enhancing the compatibility of increasing public access and use with trust objectives.

Compatibility may be enhanced through collaborative work with the public, user groups, other landowners, other agencies and organizations; through active pursuit

of non-trust financial and other support; and through prudent expenditures of management funds, where benefits to trust management can be demonstrated.

When designated or dispersed public access and use on forested state trust lands are resulting in threats to public, employee and department contractor safety; in theft, vandalism, garbage dumping and other illegal activities; or in damage to soils, water quality, plants and animals or other elements of the forest environment, the department will work to control those negative effects through collaboration with the public, user groups, other landowners, other agencies and organizations. In limited circumstances, the department will control those negative impacts by closing, limiting or restricting public access.

The department will expend prudent levels of management funds to control the impacts of dispersed public access and illegal activities to meet trust objectives, protect trust assets and meet the intent of the Multiple Use Act.

■ ALTERNATIVE 4 (DEPARTMENT RECOMMENDATION)

DISCUSSION

Alternative 4 directs the department to evaluate and manage public access and recreation based on: a) the physical condition of the area in a landscape context, including neighboring landowners; b) the characteristics of the users, including their degree of organization; and c) the reasonable availability of department financial, staff and other resources for sustainable and compatible long-term management. The management of public access and recreation must ensure protection of trust interests, including an analysis of costs and benefits. Alternative 4 describes the actions the department may take to ensure safety and compatibility with trust objectives, including environmental stewardship, through collaboration with the public, user groups, other landowners and other agencies and organizations to mitigate negative impacts, and by limiting, restricting and closing public access when necessary. Alternative 4 states that management funds will be expended to protect trust assets from any impacts associated with incompatible dispersed public access and illegal activities.

Alternative 4 best meets the applicable policy objectives by meeting the requirements of the Multiple Use Concept (Policy Objective 1), while still providing the right balance between trust income and asset protection and providing social benefits associated with public access and recreation (Policy Objective 2).

POLICY STATEMENTS

When managing public access and recreation use on forested state trust lands, the department will seek to balance economic, ecological and social concerns by evaluating on a landscape or case-by-case basis: a) the physical condition of the area in a landscape context, including neighboring landowners; b) the characteristics of the users, including their degree of organization; and c) the reasonable availability of department financial, staff and other resources for sustainable, long-term

management. The department's conclusion must ensure protection of trust interests, including an analysis of costs and benefits.

When designated or dispersed public access and use on forested state trust lands are resulting in threats to public, employee and department contractor safety; in theft, vandalism, garbage dumping and other illegal activities; or in damage to soils, water quality, plants and animals or other elements of the forest environment, the department will work to control those negative effects through collaboration with the public, user groups, other landowners, other agencies and organizations to mitigate negative impacts. Mitigation will include the closing, limiting or restricting of public access when necessary.

The department will limit expenditures of management funds to the closing, limiting or restricting of public access to control the impacts of incompatible dispersed public access and illegal activities to meet trust objectives and protect trust assets.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Under Alternative 1, there is an increased risk of adverse environmental impacts and an increase in public safety concerns. Where recreation and public access is passively managed or supported, it results in activities and potential impacts not being monitored as closely. Assessment of need for correction takes longer to occur. Declining funding and resources requires the department to favor areas of greatest use that have the greatest need for budget support, and leaves other areas with fewer resources to deal with problems. If use is not actively managed, monitored and directed, facilities and trails may deteriorate, storm and vandalism damage may not be known and assessed quickly, and use may proliferate in areas without designated and managed trail systems. As the number of activities and users rise without being managed and monitored, the risk of activities taking place in a manner or area that is not compatible with the natural environment, public safety or trust objectives also rises. The potential for impacts increases. It is increasingly difficult to direct use toward areas and use types that minimize environmental impacts and are more appropriate and compatible with trust objectives and public safety.

Under Alternative 2, the risk of adverse impacts to the natural environment is lowered, while the risk of adverse impacts to the built environment, i.e., recreational opportunities on forested state trust lands is increased. The critical aspects of Alternative 2 are the requirements that ensure that adequate and appropriate funding and support are available to ensure compatibility of public access and recreation with trust objectives. If an activity or level of use cannot be provided in a way that minimizes potential environmental and economic risks, that use will be eliminated. Activities and use levels that are adequately and appropriately funded would be maintained. This approach results in a decrease in the potential for significant environmental impacts to the natural environment primarily through the control of unauthorized and non-supported uses. Alternative 2 is dependent on active monitoring and assessment of recreation uses and a reliable decision-making process for problems that are encountered. Alternative 2 would likely require a much higher level of management fund expenditures to identify, assess and close unauthorized and potentially some currently authorized public access and recreational uses that were

incompatible with trust objectives or posed an unacceptable risk to the environment, the public and/or employee safety.

While Alternative 2 decreases potential risk to the natural environment, it also potentially decreases the amount of recreational access that would be allowed on forested state trust lands. As the funding for recreation and public access has dwindled, the potential for unmanaged use has increased. Department resources are not currently adequate to monitor recreation activities across all department-managed lands. Full implementation of Alternative 2 could result in closures of areas that cannot now be managed, particularly those where unmanaged use represents high potential for environmental damage. For instance, areas found to have trails not designated and managed by the department would likely have access restricted and facilities without funding for proper maintenance would be closed. This would result in fewer recreation opportunities on forested state trust lands.

Alternative 3 is likely to have no negative impact to recreation opportunities on department-managed forested state trust lands. Alternative 3 directs the department to collaborate with others to support recreation activities at present and increasing levels. The result would be that recreation enthusiasts could continue to engage in the variety of activities that take place on forested state trust lands today and in the future and the number of designated sites, trails and road miles open to use would likely increase, as would levels of compatible dispersed public access.

Funding would be actively pursued under Alternative 3 to address problems that were discovered through monitoring and management of recreational access and activities. This would allow for taking appropriate measures to protect natural resources, while continuing to support access for dispersed recreation activities and existing designated recreational facilities.

Alternative 3, with its emphasis on collaboration to support recreation that also could be used to rectify potential problems, would likely reduce the risk of impacts to the environment when compared to Alternative 1. However, with a greater focus on ensuring compatibility through collaboration for existing and increased levels of use, potential overall risks to the natural environment may be higher than Alternatives 2 and 4.

Alternative 4 is a more proactive approach to public access and recreation management through evaluation of the physical compatibility of the landscape to support public access and recreation and to support infrastructure available to manage public access and recreation to ensure compatibility with trust objectives and public safety. Alternative 4 directs the department to limit recreational uses if they pose risks to people, resources and the environment and limits expenditures of management funds to the closing, limiting or restricting of public access to control environmental impacts. It also promotes collaboration with others that could redirect uses to other department-managed facilities or provide for measures that would minimize or mitigate impacts.

Environmental impacts under Alternative 4 would likely be less than under Alternatives 1 and 3. This is a result of assessment of compatibility of public access and recreation with

environmental sustainability; and sited and managed to ensure compatibility with trust objectives and public safety.

CUMULATIVE IMPACTS

Impacts to the environment from recreational activities can increase, as the types and frequency of activities occur in a given area, especially those that are incompatible with trust objectives and unsupported by appropriate funding or other resources.

Alternative 1 could result in a higher risk of impacts becoming cumulative, due to lack of clear guidance and commitment to manage recreation and public access on department-managed lands. If a passive stance is taken to how the public accesses and uses the land, inappropriate use could be allowed to proliferate and at levels that increase potential for impacts to the environment. Without clear direction, frequency and intensity of public access and recreation may not be monitored in a way to allow for limitations being set where appropriate. This would increase the likelihood of significant cumulative impacts.

Alternative 2 allows for recreational and public access, when compatible with trust objectives. Alternative 2 would reduce the likelihood of significant impacts on forested state trust lands to the natural environment while substantially increasing the likelihood of significant impacts to recreational opportunities by potentially reducing the amount of recreation that occurs on these lands. Alternative 2 could substantially dislocate recreational opportunities, along with the associated negative impacts to lands other than forested state trust lands.

Alternative 3 may have an increased risk of cumulative impacts to the natural environment, but provide more access and recreational opportunities than Alternative 4. In addition, by providing more trust-compatible access and recreational uses, incompatible dispersed uses may decline or be easier to control, thereby mitigating some of the potential for cumulative adverse impacts to the natural and built environment. Seeking and securing greater funding to support the current authorized level of recreational access could mitigate adverse cumulative impacts to the built environment, i.e., recreation opportunities, by allowing the department to be proactive in directing and limiting use as appropriate.

Alternative 4 would have a somewhat decreased risk of cumulative impacts to the natural environment than Alternatives 1 and 3, by ensuring long-term and sustainable, compatible public access and recreation based on physical compatibility with the landscape and the available support infrastructure. Alternative 4 would also have a somewhat increased risk of cumulative impacts to the built environment over Alternatives 1 and 3, due to the potential closure of some areas.

3.3.2 Cultural Resources

INTRODUCTION

Forest management activities can have various impacts on archaeological, historic and cultural resources. For archaeological and historic sites, these activities can result in physical damage or destruction with a loss of cultural, scientific and historic values. For traditional cultural properties, these activities can result in physical damage or destruction, as well as a loss of privacy, isolation and perceived purity. Forest management can change species composition that can favor resources utilized by the Tribes. For example, timber harvesting, like the traditional burning of forests, can encourage the growth of berry-producing species and provide forage for game animals. Cedar growth is also promoted on many trust lands by the removal of competing tree species.

The department recognizes the significance of cultural properties, current cultural uses and historic and archaeological sites. The department also acknowledges the importance of government-to-government communications with the Tribes, as discussed in the Commissioner's Order on Tribal Relations dated April 26, 2004 (see Appendix C), as well as communications with interested stakeholders.

The following Policy Objectives apply to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2); and
- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4).

AFFECTED ENVIRONMENT

Cultural resources include prehistoric and historic archaeological sites, historic structures and areas and traditional cultural properties. The Office of Archaeology and Historic Preservation maintains both Tribal and non-Tribal information on more than 20,000 archaeological sites and more than 100,000 historic properties. Many Tribes maintain an extensive listing of cultural resource properties within ceded lands and usual and accustomed areas. Some Tribes do not share this information. Information related to cultural properties is not available through the Office of Archaeology and Historic Preservation.

Historic sites on forested state trust lands are likely to be remnants of logging, mining, homesteads and early transportation routes. For a historic overview, see Appendix D, as well as the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, pages D-67 to 69.

Cultural properties on forested state trust lands can take many forms. Vision quest sites, ceremonial bathing and gear storage sites, plant gathering and hunting sites are all examples. These sites are either known and recorded by the Tribes or are known by the Tribes, but not recorded or shared.

REGULATORY FRAMEWORK

Chapter 27.34 RCW, Archaeology and Historic Preservation: The Legislature declares it the public interest to designate, preserve, protect, enhance and perpetuate structures, sites, districts, buildings and objects of historic, archaeological, architectural or cultural value. The Office of Archaeology and Historic Preservation administers this law.

Chapter 27.44 RCW, Indian Graves and Records: Indian burial sites, cairns, glyptic markings and historic graves located on public and private land are to be protected. Any person who knowingly removes or damages Native American cairns, graves, pictographs or petroglyphs, or sells artifacts or human remains from graves is guilty of a Class C felony. A Tribe or enrolled member can bring civil action to secure an injunction, damages or other appropriate relief.

Chapter 27.53 RCW, Archaeological Sites and Resources: Information from archaeological sites is declared a public interest. Archaeological sites and artifacts on forested state trust lands, whether previously recorded or still unrecognized, are declared property of the state. Disturbing archaeological resources without a permit from the Office of Archaeology and Historic Preservation is unlawful. Civil and criminal penalties may apply. Archaeological site information is declared exempt from public disclosure.

Chapter 25-48 WAC (implements chapter 27.53 RCW): Archaeological excavation and removal permit.

WAC 222-16-050(1)(f) (state Forest Practices Rules): Timber harvest, construction of roads, landings, rock quarries, gravel pits, borrow pits and spoil disposal areas on archaeological or historic sites registered with the Office of Archaeology and Historic Preservation or on sites containing evidence of Native American cairns, graves or glyptic records, as provided for in chapters 27.44 RCW and 27.53 RCW are Class IV-Special forest practices. The department shall consult with affected Tribes in identifying such sites.

WAC 222-16-050(5)(k) (state Forest Practices Rules): Harvesting, road construction, site preparation or aerial application of pesticides on lands with cultural, historic or archaeological resources are Class III forest practices. Cultural resources must be on or be eligible for listing on the National Register of Historic Places or must have been identified to the department as being of interest to an affected Tribe.

WAC 222-20-120: Notice of forest practices to affected Indian Tribes: (1) the department shall notify affected Indian tribes of all applications of concern to such tribes, including those involving cultural resources, identified by the Tribes. (2) Where an application involves cultural resources the landowner shall meet with the affected tribe(s) with the objective of agreeing on a plan for protecting the archaeological or cultural value. The department may condition the application in accordance with the plan. (3) Affected

Indian Tribes shall determine whether plans for protection of cultural resources will be forwarded to the Office of Archaeological and Historic Preservation.

WAC 222-16-010 General definitions: “Cultural Resources” means archaeological and historic sites and artifacts and traditional religious, ceremonial and social uses and activities of affected Indian Tribes.

The landowner must meet with the Tribes “with the objective of agreeing on a plan for protecting the archaeological or cultural value.”

DNR Policy, PO06-001 Historical, Cultural and Archeological Sites: All department personnel will identify potential archaeological, historic and cultural sites/resources in the course of their normal duties. Regulatory staff will assist and encourage private landowners to identify, inventory and protect cultural resource sites on their land. Discovered resources will be recorded and inventoried in coordination with the Office of Archaeology and Historic Preservation and/or the appropriate Tribes, so that they can be protected to the full extent allowable by law. The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level which, at a minimum, meets regulatory requirements.

1987 Timber, Fish and Wildlife Agreement: The department will update and maintain a system with information on archaeological and cultural resources. The Tribes may provide the department with general location information for those resources. Forest practices applications will be cross-checked against the system and landowners/operators and the affected Tribe(s) will be immediately notified. All requirements of state Forest Practices Rules must be met.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 directs the department to establish a program for identifying and protecting historic and archeological sites on forested state trust lands. Alternative 1 is limited, because it doesn't address culturally-significant areas, such as traditional cultural properties and current cultural uses. They are, however, addressed under the state Forest Practices Rules WAC 222-20-120 and WAC 222-16-010. Alternative 1 does not appear to meet Policy Objectives 2 and 4 as well as Alternative 2.

POLICY STATEMENT

***Forest Resource Plan Policy No. 24, Identifying Historic Sites:* “The department will establish a program to identify and inventory historic and archaeological sites and protect them at a level which, at a minimum, meets regulatory requirements.”**

■ ALTERNATIVE 2 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 2 directs the department to maintain its existing program for identifying and protecting historic and archaeological sites consistent with state and federal law.

Alternative 2 directs the department to actively communicate and promote collaboration with the Tribes on issues related to culturally-significant areas, such as traditional cultural properties and current cultural use. Alternative 2 also directs the department to work with interested stakeholders on issues related to non-Tribal cultural uses, historic and archaeological sites. Alternative 2 recognizes that on occasion, it may be in the best interest of the trusts to consider transferring ownership of trust lands with significant archaeological, historic and cultural resources, when compensation to the trusts is secured. Alternative 2 best meets the applicable policy objectives by encouraging partnerships with the Tribes and interested stakeholders (Policy Objective 4). In addition, Alternative 2 provides balance between trust income and protection of historic, archaeological and culturally-significant areas or resources through compensation to the affected trust where appropriate (Policy Objective 2).

POLICY STATEMENTS

The department will protect significant historic and archaeological sites consistent with state and federal law.

The department will actively communicate and promote collaboration with Tribes and interested stakeholders to address culturally-significant areas.

When in the best interest of the trusts, the department will consider transfer of ownership of historic, archaeological and culturally-significant areas when compensation to the trusts is secured.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

No significant adverse impacts are identified for either alternative. The department has a tribal liaison, a professional archaeologist, cultural resource technicians in every region except Northeast and many field personnel trained to recognize cultural resources.

In addition, the department frequently enters into memoranda of agreement with Tribal governments to protect traditional cultural properties and maintain Tribal access to resources and localities important to the continued practice of their traditional cultures.

The main gap in the department's cultural resource program is dedicated time for the cultural resource technicians to address cultural resource issues, including procedural communication and collaboration with the Tribes and other interested stakeholders. As a result, known-state recorded sites are systematically identified, evaluated and mitigated, while known-not recorded and Tribally-recorded (such as traditional cultural properties) and unknown-unrecorded sites are not systematically identified, evaluated and mitigated.

Similar to what is required under current state Forest Practices Rules, Alternative 2 commits the department to actively communicate and promote collaboration with the Tribes on issues related to Tribal access, Traditional Cultural Properties and cultural uses. The department will also work with other interested stakeholders on issues related to non-Tribal cultural uses, and historic and archaeological sites. Alternative 2 emphasizes this broader need to address cultural resource issues and will help the department fulfill the cultural resource commitments made in the *Habitat Conservation Plan*. Known-state recorded sites will continue to be systematically identified, evaluated and mitigated. In addition, the likelihood that Tribally-recorded, known-not recorded and unknown-unrecorded sites will also be systematically identified, evaluated and mitigated is increased.

CUMULATIVE IMPACTS

Although current state and federal law addresses the need to communicate with the affected Tribes, the emphasis under Alternative 2 to promote collaboration regarding culturally-significant areas with the Tribes and others is intended to provide additional mitigation to avoid or minimize long-term adverse impacts that may occur apart from this emphasis.

3.3.3 Visual Management

INTRODUCTION

Population growth, especially in Western Washington, has significantly increased the visibility of department management activities. Department activities can alter the visual nature of forest stands and forested landscapes. These visual changes can be local in nature, such as views from a recreational trail or an individual residence, or regional, such as foreground and background views from a county road or state highway, or a background view to cities and towns.

The following Policy Objectives apply to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2); and
- Pursue outcome-based management within a flexible framework (Policy Objective 6).

AFFECTED ENVIRONMENT

The visibility of forestry operations is influenced by many factors. These factors include the position and distance of the viewpoint from the activity, the topography of the land, the type of operation and the intensity and/or concentration of activities, what is revealed as a result of the activity and how long the activity is in view. The observer's background and personal values influence whether the reaction to the visual impact is positive, neutral or negative.

The department utilizes a variety of strategies and mechanisms to mitigate visual impacts. The department often uses early community outreach to help determine any visual sensitivity to the proposed activity.

REGULATORY FRAMEWORK

The state Forest Practices Rules (WAC 222-30-025) address even-aged harvest size and timing. In addition, the rules address forest management activities within the boundaries of any national park, state park or any park of a local governmental entity. While these rules are not specifically related to mitigating visual impacts of harvest activities, they can have that result. Generally, these rules restrict even-aged harvests to 240 acres maximum, with any even-aged harvest between 120 acres and 240 acres potentially reviewed by an interdisciplinary team. Even-aged harvest, as defined in WAC 222-16-010, generally means:

- Clearcuts;
- Seed tree or shelterwood harvests in which 20 or fewer trees per acre remain after harvests;

-
- Group or strip shelterwood harvests creating an opening wider than 2 tree heights, based on dominant trees;
 - Shelterwood removal harvests which leave fewer than 150 trees per acre, which are at least 5 years old or 4 feet in average height;
 - Partial cutting in which fewer than 50 trees per acre remain after harvest;
 - Overstory removal when more than 5,000 board feet per acre is removed and fewer than 50 trees per acre at least 10 feet in height remain after harvest; and
 - Other harvesting methods designed to manage for multiple age classes in which 6 or fewer trees per acre remain after harvest.

The rules go on to state that harvest units shall be designed so that each unit meets at least one of the following criteria:

- At least 30 percent of the unit's perimeter is in stands of trees that are 30 years of age or older;
- At least 60 percent of the unit's perimeter is in stands of trees that are 15 years or age or older; or
- At least 90 percent of the unit's perimeter is in stands of trees that have survived on site a minimum of 5 growing seasons or, if not, have reached an average height of 4 feet.

In addition to the state Forest Practices Rules, the department must comply with the State Environmental Policy Act (chapter 43.21C RCW), which requires consideration of aesthetic impacts from its timber harvesting activities.

The Columbia River Gorge National Scenic Area provides additional regulatory framework for the department. The scenic area was established in 1986 to protect and provide for the enhancement of the scenic, cultural, recreational and natural resource of the Columbia River Gorge and protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development.

The Columbia River Gorge National Scenic Area is divided into three categories of land: Urban Areas, the Special Management Area and the General Management Area. There are approximately 2,900 acres of forested state trust lands within the Special Management Area. These lands must be managed according to the restrictions of the Special Management Area, which include a maximum even-age harvest unit size of 15 acres, variable unit boundary lines, retention of 17 snags per acre and a submission of all harvest proposals to the Scenic Area Review Committee.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 limits the visual impacts of even-aged timber harvesting by limiting the size of harvest units and by controlling and dispersing harvests over time. Even-aged timber harvesting involves cutting most of the trees on a particular site or unit at one time to produce stands that are of the same relative age. It is generally any harvest that retains 20 trees per acre or less after harvest. A particular timber harvest may involve multiple harvest units. Alternative 1 limits these harvest units to a maximum of 100 acres in size. It also prohibits harvesting within 300 feet of another harvest unit, if the combined acreage of the two units exceeds 100 acres. Alternative 1 has been referred to as “green-up,” because it requires the department to have visible trees, at least four feet in height, before an adjacent stand can be even-aged harvested. Alternative 1 applies to all even-aged harvest units, regardless of their visibility or the nature of the visual impact. Alternative 1 is not as flexible in recognizing and using methods to mitigate for visual impacts as a result of harvest methods, arrangement of leave trees or the presence of riparian and wetland buffers as Alternative 2.

Because Alternative 1 was put in place prior to the *Habitat Conservation Plan* and state Forest Practices Rules related to even-aged harvest size and timing, Alternative 1 does not recognize the mitigation provided by the state Forest Practices Rules regarding even-aged harvest size and timing. Nor does it consider that retention of riparian and wetland buffers, protection of unstable slopes, and arrangement of leave trees all break up the visual impact of harvest activities on the landscape. Alternative 1 does not appear to meet Policy Objectives 2 and 6 as well as other alternatives.

POLICY STATEMENT

***Forest Resource Plan Policy No. 32, Green-up of Harvest Units:* “The department will reduce the impacts of clearcutting and certain even-aged silvicultural systems by generally limiting the size of harvest areas to a maximum of 100 acres, requiring “green-up” of adjacent areas before harvesting timber and employing other techniques to blend harvested areas into the landscape.”**

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 eliminates the 300-foot buffer requirements in Policy No. 32. The 100-acre limit on even-aged harvest units is retained in the department’s recommended alternative for Watershed Systems. Alternative 2 relies on additional strategies to mitigate for visual impacts of the department’s management activities. The department will assess the cost/benefit to trust beneficiaries of prudent expenditures to mitigate visual impacts, in

light of regional public concerns. Alternative 2 does not appear to meet Policy Objective 2 as well as Alternative 4, but appears to meet Policy Objective 6 as well as Alternative 4.

POLICY STATEMENTS

The department will consider the visual impacts of management activities and design appropriate mitigation strategies based on whether the impacts are of local or regional significance.

For local visual impacts, the department will generally mitigate visual impacts through design and application of other land management requirements. For regional visual impacts, the department will develop additional strategies to mitigate impacts. The department will assess the cost/benefit to trust beneficiaries of prudent expenditures to mitigate visual impacts, in light of regional public concerns.

■ ALTERNATIVE 3

DISCUSSION

Alternative 3 specifies a case-by-case approach and provides no guidance as to methods to mitigate for visual impacts based on the level of significance, either local or regional. Alternative 3 may not result in adequate mitigation in some cases or, in other cases, it may provide more than is necessary to address impacts. Alternative 3 does not appear to meet Policy Objective 2 as well as the other alternatives, but best meets Policy Objective 6.

POLICY STATEMENT

The department will mitigate visual impacts as needed for local or regional issues, recognizing that there may be different strategies, depending on the scope and scale of the issue.

■ ALTERNATIVE 4 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 4 eliminates the 300-foot buffer requirements in Policy No. 32. The 100-acre limit on harvest units is also eliminated from Alternative 4. However, the 100-acre limit on harvest units is retained in the department's recommended alternative for Watershed Systems. In addition, Alternative 4 integrates other management requirements, such as leave trees, riparian and wetland buffers and protection of unstable slopes into site-specific visual management for local impacts. Alternative 4 relies on additional strategies to mitigate for regional visual impacts of the department's management activities. The department will assess the cost/benefit to trust beneficiaries of prudent expenditures to mitigate visual impacts, in light of regional public concerns. Under Alternative 4, the department will utilize land management requirements, such as riparian and wetland buffers; protection of unstable slopes; and location and arrangement of wildlife trees to

create buffers or screening of harvest activities. In addition, the department utilizes different silvicultural strategies; timing, design and size of timber harvest units; the arrangement of harvest units over time and space across landscapes; compliance with the “green-up” requirements of the state Forest Practices Rules; as well as visual modeling tools to mitigate visual impacts. Alternative 4 also provides a mechanism for transferring forested state trust lands that are visually significant out of trust status, with compensation to the affected trust(s).

Alternative 4 best meets the applicable policy objectives, as it allows flexibility for professional field staff to address visual impacts based on the nature of the impact and use of a variety of strategies for mitigation where appropriate, while still meeting the needs of each trust beneficiary (Policy Objective 6). Alternative 4 also provides balance between trust income and mitigation for impacts to visually significant areas through compensation to the affected trust where appropriate (Policy Objective 2).

Draft Procedure PR14-004-080 rescinds the current Visual Management and Maintaining Mature Forest Components procedures and adds a new procedure that implements Alternative 4. See Appendix E for the draft procedure language.

POLICY STATEMENTS

The department will consider whether there are visual impacts of management activities and design appropriate mitigation strategies based on whether any impacts are of local or regional significance.

For local visual impacts, the department will generally mitigate visual impacts through design and application of other land management requirements. For regional visual impacts, the department will develop additional strategies to mitigate impacts. The department will assess the cost/benefit to trust beneficiaries of prudent expenditures to mitigate visual impacts, in light of regional public concerns.

When in the best interest of the affected trust(s), the department will consider transfer of ownership of significant scenic areas, when compensation to the affected trust(s) is secured.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

No significant adverse impacts are identified to scenic resources or aesthetics under Alternative 1. However, there is an increased risk of adverse impacts to the natural environment associated with the potential for increased road mileage under Alternative 1. Alternative 1 applies visual criteria to all harvest units, regardless of their visibility. Spacing timber harvest units 300 feet apart and regulating their size to less than 100 acres is used to break up the unnatural pattern of clearcutting to promote shapes, patterns, scale and size that more reflect the natural characteristics of the landscape. In some cases, requiring 300-foot buffers between 100-acre maximum harvest units requires more road miles to be kept open for longer periods of time. This would not necessarily be the case if the department relied on state Forest Practices Rules regarding even-aged harvest size and timing. Keeping roads open can lead to greater impacts to fish and wildlife habitat, water quality and quantity, as well as to visual impacts.

Although Alternative 1 provides greater certainty of minimal widths between harvest units, it does not provide maximum flexibility to minimize total open road mileage and will likely increase the risk of adverse impacts to the environment than the other alternatives.

No significant adverse impacts to scenic resources or aesthetics are identified for Alternative 2. Although elimination of the 300-foot buffer requirement between even-aged harvest units may result in approximately as much as 1,500 additional acres per year available for harvest this decade, it is not expected to increase the risk of adverse impacts to aesthetics, due to requirements of the *Habitat Conservation Plan* for riparian protections, unstable slope protection, hydrologic maturity and habitat thresholds. In Eastern Washington, harvest is expected to continue to be predominantly partial cuts. Those conservation strategies result in retention of more trees across the landscape in irregular patterns that break up visual impacts of harvest unit boundaries. The environmental impacts associated with state Forest Practices Rules regarding even-aged harvest size and timing are discussed in the *Final Environmental Impact Statement for the Proposed Forest Practices Rules and Regulations and Appendixes* pages 91 to 98, and are incorporated here by reference. The department's recommended retention of the 100-acre maximum even-aged harvest unit limit in the Watershed Systems policy subject area is expected to continue to provide additional mitigation of visual impacts. Harvest levels would not increase beyond those identified and analyzed in the sustainable harvest calculation for Western Washington. Average even-aged harvest unit size would be expected to stay relatively the same on forested state trust lands in Western Washington, due to requirements of the *Habitat Conservation Plan* for riparian protections, unstable slope protection, hydrologic maturity and habitat thresholds. In Eastern Washington, harvest is expected to continue to be predominantly partial cuts. Treatment of forest health issues will sometimes require larger harvest units and more intense harvesting in both Eastern and Western Washington (see the Forest Health policy subject area discussion).

Under Alternative 2, the department would further reduce regional visual impacts of its harvest activities when they are identified through development of additional mitigation strategies.

Under Alternative 3, the reliance on site specific evaluation and strategies designed to mitigate on a case-by-case basis increases the risk of adverse impacts to scenic resources and aesthetics. The environmental impacts associated with visual management strategies that are developed through a forest land planning process or as part of a timber harvest design would be evaluated at that time as part of a SEPA review. Because of the lack of a consistent standard in Alternative 3, the risk to visual impacts from harvest activities are likely increased.

The environmental impacts associated with Alternative 4 are similar to those associated with Alternative 2. Alternative 4 would also be mitigated by the 100-acre even-aged harvest size limitation recommended by the department under the Watershed Systems policy subject area.

The potential adverse impacts under Alternative 4 are expected to be less than the other alternatives, because of the increased flexibility added to Alternative 4 that can provide permanent protection of visually significant forested state trust lands through transfer out of trust status with compensation to the affected trust(s). Under Alternative 4, visually significant forested state trust lands can be permanently protected through transfer out of trust status, with compensation to the affected trust(s). This will result in even less impacts to visual resources than the other alternatives.

CUMULATIVE IMPACTS

Under all of the alternatives, visual impacts of department harvest activities are mitigated as a result of compliance with *Habitat Conservation Plan* commitments. Establishment of riparian and wetland buffers, protection of unstable slopes, retention of large, structurally unique trees, maintenance of hydrologic maturity and specific habitat development and retention strategies all contribute to mitigation of visual impacts associated with department harvest activities. Because the department has these requirements (that in most cases exceed state Forest Practices Rules), while many neighboring private forest lands may not, visual impacts of department activities may or may not be less than those associated with many private forest lands. Where the department also develops other strategies to mitigate visual impacts, in addition to mitigation provided by complying with state Forest Practices Rules and the *Habitat Conservation Plan*, then cumulative impacts to visual resources are even less. Finally, provisions for transferring ownership of visually significant forested state trust lands, with compensation to the affected trust(s), provides a mechanism for more permanently protecting highly valued scenic resources associated with forested state trust lands.

3.3.4 Local Economic Vitality

INTRODUCTION

Meeting each trust beneficiary’s economic and ecological objectives results in social benefits. Management of forested state trust lands provides clean water, wildlife habitat, forests for recreation, as well as jobs for local economies. Forested state trust lands near local communities supply jobs in the forest products industry, both in the woods and in local mills, that process timber from forested state trust lands. Some niche industries are dependent on forest products from forested state trust lands. In addition, these lands often attract recreationalists who spend money in local communities. These products and uses contribute to local economic vitality, which can be affected by location and timing of management activities and access to forested state trust lands.

The following Policy Objective applies to this policy subject area:

- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2).

AFFECTED ENVIRONMENT

In 1996, the department commissioned a study by Deloitte and Touche LLP on the economic value and contributions of state management trust lands and activities associated with them. This study, in part, investigated the extent that activities on department-managed lands contributed indirectly to the community and state through the creation of jobs; through the wages and salaries, i.e., income, that are created by those jobs; state and local taxes, which included “market related” activities or jobs, incomes and tax payments that resulted from commercial activities; as well as “non-market” activities related to recreational, social, cultural and ecological activities. The findings of this study for forested state trust lands are summarized in Table 5.

Table 5: Annual Indirect Market and Non-Market Benefits from Forested State Trust Lands			
Benefit Type	Market	Non-Market	Total
Jobs Generated	7,900	6,340	14,240
Wage & Salary Income Earned	\$ 170,373,000	\$ 54,597,600	\$ 224,970,600
Taxes Paid	\$ 25,364,000	\$ 21,638,000	\$ 47,002,000

Market and non-market activities on forested state trust lands make significant contributions to local, regional and state economies beyond direct financial support of trust beneficiaries. A full discussion of indirect market and non-market benefits and the methodology for calculation is contained in the 1996 Deloitte and Touche study (Chapter 5).

REGULATORY FRAMEWORK

There is no regulatory framework related to this policy subject area.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 provides no policy direction with regard to local economic vitality. Currently, the contribution to local economies as a result of land management activities is not a formal consideration by the department, but happens coincidentally with management on behalf of each trust beneficiary. Alternative 1 does not appear to meet Policy Objective 2 as well as other alternatives.

POLICY STATEMENT

No current policy direction.

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 directs the department to support local economic vitality when doing so is compatible with, or contributes to, attainment of trust objectives. Alternative 2 requires the department to work with local economic interests during department forest land planning efforts. Alternative 2 commits the department to consider local economic impacts of its land management decisions and activities. Alternative 2 better meets Policy Objective 2 than Alternative 1, but not as well as Alternative 3.

POLICY STATEMENTS

The department will actively support local economic vitality as part of its management of forested state trust lands when it is compatible with or contributes to the attainment of trust objectives.

The department will work with local economic interests as part of its forest land planning processes.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 recognizes the relationship between the department's management activities and local economic vitality and suggests that the department may make decisions that contribute to local economic vitality when compatible with meeting trust objectives. Alternative 3 best meets the applicable policy objective by providing the right balance between trust income and providing other social benefits through promotion of local economic vitality (Policy Objective 2).

POLICY STATEMENT

The department may consider the relationship between local economic vitality and forest management activities and may take actions in support of local economic vitality when they are compatible with or directly support trust objectives.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Department management would not change from what is currently done in regard to local economic vitality. Any contributions to local economic vitality are coincidental to management activities that implement other Board of Natural Resources policy. Those activities are reviewed under SEPA at the appropriate point of planning and implementation. Consequently, there would be no significant environmental impacts or mitigation measures unique to this action.

Under Alternative 2, the department may alter location and timing of certain land management activities or uses to support local economies when compatible with trust objectives. These uses and activities would be carried out in compliance with existing Board of Natural Resources policy, including the sustainable harvest level, *Habitat Conservation Plan* requirements and state and federal law. Any environmental impacts associated with actions taken as a result of consideration of local economic vitality cannot be identified at this time.

The analysis for Alternative 3 is identical to the analysis for Alternative 2.

CUMULATIVE IMPACTS

There are no significant adverse impacts to the environment identified as a result of any of the alternatives. The location and timing of certain land management activities or uses to support local economies would be carried out in compliance with existing Board of Natural Resources policy including the sustainable harvest level, *Habitat Conservation Plan* requirements and state and federal law, when compatible with trust requirements. Any activity or use would undergo any required SEPA review at the time it was considered. Any cumulative environmental impacts associated with actions taken in consideration of local economic vitality cannot be identified at this time.

3.4 Implementation

This major policy category contains policy subject areas related to implementation of the *Policy for Sustainable Forests*. These subjects address the department's forest land planning approach; silvicultural and research activities on forested state trust lands; public relations and communication; as well as the processes the department will utilize to ensure that Board of Natural Resources' policies are kept current and meaningful.

3.4.1 Forest Land Planning

INTRODUCTION

The purpose of forest land planning is to translate outcomes established by state and federal law and Board of Natural Resources policy into specific activities in the field. Forest land planning should document and model forest management strategies and demonstrate where and what types of activities will most likely meet the outcomes. The department has always believed that a dynamic planning process will accommodate management needs, changing rules and public concerns.

The following Policy Objectives apply to this policy subject area:

- Ensure policies are succinct, relevant and easily understood by the public and department employees (Policy Objective 3); and
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5).

AFFECTED ENVIRONMENT

Forest land planning by itself does not modify the environment. However, planning results in defining standards that control management activities across landscapes and, therefore, planning decisions are subject to State Environmental Policy Act (SEPA) review (WAC 197-11-800(20) and WAC 197-11-704(2)(b)).

The department currently has one planning policy in the *Forest Resource Plan*, Policy No. 16, Landscape Planning. In addition, the department developed a planning procedure for guiding the implementation of the 2004 sustainable harvest calculation (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Appendix F, Procedure No. PR14-001-010, Sustainable Harvest Implementation Planning).

The purpose of landscape planning identified in Policy No. 16 is "to develop a pragmatic working tool for the professional forester that will show at any given time the department's plans for a particular landscape." The department's landscape planning efforts are based on a process of developing management objectives for forested state trust lands at a landscape, watershed or ecological unit scale. The size of these planning units has ranged from several thousand acres to tens of thousands of acres. The purpose

of landscape planning has been to translate the general policies of the *Forest Resource Plan* into specific activities in the field, including evaluating harvest and multiple-use activities.

In Western Washington, the department delineated 83 landscape planning units. To date, numerous landscape plans have been started. These landscape plans contain management objectives for conducting silvicultural activities; scheduling timber harvests; protecting aquatic systems, watersheds, riparian areas, wetlands and wildlife habitat, including endangered or threatened species; building or maintaining road systems; and various other components.

The Sustainable Harvest Implementation Planning Procedure No. PR14-001-010 provides direction for developing strategies to implement Board of Natural Resources policies and the sustainable harvest calculation. The primary purpose of the Sustainable Harvest Implementation Planning Procedure is to describe how field operations within a *Habitat Conservation Plan* planning unit and over a ten-year period, are going to achieve the outcomes identified in the sustainable harvest calculation and other Board of Natural Resources policies.

The implementation plans will be subject to environmental analysis and public review under SEPA. Once finalized, each implementation plan will be subject to approval by the department's Land Steward (*Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Appendix F).

The department's *Habitat Conservation Plan* contains geographic-specific conservation objectives and strategies. These include development of nesting, roosting, foraging and dispersal habitat, and analysis of hydrologic maturity as it relates to rain-on-snow zones. The *Habitat Conservation Plan* anticipated that landscape planning would be part of the process for implementing conservation strategies (*Final Habitat Conservation Plan*, page IV. 192).

REGULATORY FRAMEWORK

There are no regulations that apply to this policy subject area.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 is based on a process of developing management objectives for forested state trust lands at a landscape, watershed or ecological unit scale. The size of these planning units has ranged from several thousand acres to tens of thousands of acres. The purpose of landscape planning has been to translate the general policies of the *Forest Resource Plan* into specific activities in the field. Alternative 1 focuses on developing management objectives through a public process, consistent with Board of Natural

Resources policy for individual landscapes. Alternative 1 does not appear to meet Policy Objectives 3 and 5 as well as Alternative 2.

POLICY STATEMENT

Forest Resource Plan Policy No. 16, Landscape Planning: “The department will develop plans by setting management objectives for timber and non-timber resources for specified landscapes consistent with the *Forest Resource Plan*.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 proposes a department forest land planning process that: 1) describes measurable outcomes as established by state and federal law, as well as Board of Natural Resources policy for a specified geographical area (smaller than the state); 2) specifies forest management strategies to achieve outcomes; and 3) provides adaptive management through feedback and communication that refine strategies and outcomes as appropriate.

Measurable outcomes can encompass aspects of the economic, ecological and social environment. These outcomes are reflected in the *Habitat Conservation Plan* and the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*. Examples include desired stand structures, volume targets and riparian and wetland buffers. Forest management strategies developed through forest land planning assist the department’s forest managers in creating and implementing efficient and effective operational plans to achieve outcomes. Feedback and communication components of a forest land plan provide important information for developing, modifying and adapting plans to meet the outcomes, as well as guide any appropriate refinements to those outcomes and the strategies developed to achieve them. These components include status reports to the Board of Natural Resources on progress toward accomplishment of outcomes and provide for important stakeholder and public participation.

Alternative 2 provides a clearer distinction of the planning steps, articulating already established policy outcomes and developing forest management strategies to achieve outcomes. Alternative 2 establishes communication and feedback components to provide for stakeholder and public participation. Alternative 2 proposes to enlarge the geographic planning scale for developing forest land plans from several thousand acres, to *Habitat Conservation Plan* planning units (hundreds of thousands of acres in size). The enlarged planning scale will provide a more comprehensive examination of the effects of forest management strategies across multiple landscapes in achieving outcomes. However, some forest management strategies may focus on smaller geographic units to address critical, localized issues. Alternative 2 recognizes that these plans will be developed as time and resources allow and will integrate, as appropriate, other existing forest plans. Alternative 2 best meets the applicable policy objectives by clearly describing how the department will utilize forest land planning to communicate management outcomes and strategies to achieve those outcomes within specified landscapes (Policy Objective 3). In

addition, Alternative 2 relies on the latest technology and science in carrying out forest land planning (Policy Objective 5).

POLICY STATEMENTS

The department will develop forest land plans at the *Habitat Conservation Plan* planning unit scale in implementing Board of Natural Resources policy.

For areas outside the *Habitat Conservation Plan*, the department will develop forest land plans at a scale similar to *Habitat Conservation Plan* planning units in implementing Board of Natural Resources policy.

The department may use different scales to address unique circumstances.

The department will utilize the State Environmental Policy Act to communicate department objectives and outcomes; to consider local, regional and statewide interests and concerns; and to develop and analyze forest management strategies.

The department will prioritize and develop new forest land plans over time. The preparation of plans will be based on available resources and budget.

As plans are developed, the department will integrate previous planning work within new forest land plans, as appropriate.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

There are no probable significant adverse environmental impacts from either alternative. These alternatives describe a planning process the department will use. Any adverse environmental impacts, including cumulative impacts, of activities to be conducted under the plans will be analyzed under SEPA at the time the plans are developed. The planning process described in Alternative 1 was designed to integrate the various elements that must be considered in managing forested state trust lands. Policy No. 16 intended to use geographical information systems to generate detailed maps. These geographical information systems were expected to display physical information, such as soil types, roads and wildlife habitat locations on a computer-generated map. Landscape-level maps and supporting information were expected to contain specific objectives for department activities developed through the landscape planning process (*Final Environmental Impact Statement for the Forest Resource Plan*).

In setting management objectives under Alternative 1, the landscape planning process sometimes resulted in reinterpreting or redefining already established outcomes. In addition, the cost to undertake and complete these plans has been prohibitive. This has primarily been driven by not having a well-defined planning process or product and the requirement for numerous plans, which resulted in sporadic planning efforts around the state. Under Alternative 1, some landscape plans are still being developed, such as the *Loomis State Forest Landscape Plan*.

Under Alternative 2, established outcomes would be clearly described for the planning unit. The forest land planning process would not seek to reinterpret or change these

expected outcomes. Under Alternative 2, forest management strategies would be developed to achieve these outcomes. These strategies will link outcomes with operational activities and will provide a working tool for use by the department's land managers and foresters.

Alternative 2 incorporates public participation and communication into its forest land planning process. The process will allow Tribes, stakeholders and the public the opportunity to learn about expected outcomes, provide input and receive feedback on department strategies to achieve those outcomes. This process will provide the department and the Board of Natural Resources with information on the effectiveness of the proposed policy direction and expected outcomes and on the environmental impacts of their decisions.

Under Alternative 2, landscape plans still being developed, such as the *Loomis State Forest Landscape Plan*, would be integrated into this new planning approach, if adopted by the Board of Natural Resources.

CUMULATIVE IMPACTS

There are no adverse cumulative impacts related to these policy alternatives. Cumulative impacts, if any, on activities to be conducted under the plans will be evaluated under SEPA when the plans are developed.

3.4.2 General Silvicultural Strategy

INTRODUCTION

The department defines silviculture as the art and science of cultivating forests to achieve outcomes identified by state and federal law and Board of Natural Resources policy. The application of silvicultural strategies is one of the primary mechanisms for achieving desired outcomes across landscapes. These strategies may be developed and analyzed through a forest land planning process like sustainable harvest implementation planning. Silvicultural prescriptions incorporate activities, such as site preparation; planting specific tree species at specified densities; fertilization; removal of non-desirable species; and intermediate as well as final harvesting of trees. Stand-specific activities contributes to landscape and statewide outcomes, such as the sustainable harvest calculation and the *Habitat Conservation Plan*.

The following Policy Objectives apply to this policy subject area:

- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5); and
- Promote active, innovative and sustainable stewardship on as much of the forested land base as possible (Policy Objective 7).

AFFECTED ENVIRONMENT

The practice of silviculture on forested state trust lands potentially affects several elements of the environment, including habitat, plants and animals, water, earth and aesthetics. Although these elements may be directly affected by the practice of silviculture, its impact to specific elements are addressed under other specific policy subject areas, e.g., Forest Health, Wildlife Habitat, Watershed Systems, Riparian Management Zones and Visual Management. These other policy subject areas cover the range of silvicultural systems activities used on forested state trust lands and their potential for affecting elements of the environment. Silvicultural prescriptions are designed and implemented to accomplish site-specific stand objectives. Stand objectives are written to meet landscape or statewide objectives or outcomes, such as revenue generation, restoration of structurally complex forests and creation of habitat. Silvicultural treatments do not always result in removal of material from the stand. These types of treatments, known as pre-commercial thinnings, leave cut material in the stand to provide woody debris or habitat value to the stand.

In contrast, commercial thinning removes a portion of a stand, leaving a substantial number of trees after a timber harvest. Commercial thinnings are typically carried out where there are multiple objectives, such as generating revenue, while accelerating the forest stand's development towards functional wildlife habitat.

Currently, the department most often implements commercial thinnings in stands that are in the competitive exclusion stage of stand development, particularly in stands where

thinning would accelerate achievement of wildlife habitat objectives or outcomes. For a description of the stand development stages, see the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Appendix B. Trees in the competitive exclusion stage compete for direct sunlight, nutrients and water. Where soil moisture is in ample supply, competition is generally between tree-crowns for sunlight. In arid forests, common to the ponderosa pine and Douglas-fir series in Eastern Washington competition for soil moisture is keen, resulting in open-grown stands due to root, instead of crown, competition. At the competitive exclusion stage, stands are nearing, full-site occupancy and have little diversity in tree size, unless legacy trees remain from previous successions or management. Traditional commercial forestry thinning sought to capture natural tree mortality before it occurred, by harvesting the smaller trees that would likely die without harvest. Commercial thinning in these competitive exclusion stands is usually conducted from below the upper canopy, i.e., the thinning treatment removes the smallest trees first. Thinning usually results in about 70 percent of the initial stand remaining after harvest. Traditional thinning treatment typically does not affect the stand's most dominant trees. The diversity of tree sizes of the dominant trees remains much the same as prior to the thinning treatment, but the stand's optimal growth rate is sustained.

A structurally complex forest stage must have vertical and horizontal diversity in terms of tree heights, diameters, tree spacing, large standing dead trees (snags) and large woody debris. To obtain those structural characteristics, a stand needs to develop along somewhat specific developmental "pathways" through time. The earlier a stand's intended pathway is initiated, the better control the forest manager has over mixtures of shade tolerant and intolerant species, which influence vertical development and diversity, as well as stocking levels, which influence horizontal development and diversity. Stands that have progressed to a competitive exclusion stage present a decision as to whether or not to accelerate the stand's transition into an understory development stage. Establishing shade tolerant tree species under the main tree canopy provides smaller trees that can grow and develop into a mid-story. This development will, in time, accelerate the vertical and horizontal diversity of tree sizes. The remaining overstory trees will continue to develop and grow larger until they can be recruited either naturally or artificially through management intervention to provide large standing dead trees or large woody debris.

Managing stands along developmental pathways require forest managers to have a comprehensive understanding of the structures and processes in forest stands (Franklin, 2002; and Carey, 2003). Carey et al. (1996) used the phrase "biodiversity pathways" for the management of forest stands and forested landscapes to achieve objectives of conserving biodiversity and generating revenue through the application of silviculture that accelerates the development of structurally complex stands. The department does this through forest ecology-based silvicultural prescriptions that optimize attainment of economic, ecological and social objectives. Silvicultural prescriptions are implemented over temporal and spatial scales at appropriate rates to meet landscape or statewide objectives in uplands, as well as adjacent riparian areas.

Although the Franklin-Carey approach has focused on forests west of the Cascade crest, the ecological principles apply to Eastern as well as to Western Washington. Silvicultural

treatments, if grounded in biological capabilities of each site and constraints of surrounding landscapes, will accelerate and guide stand development along pathways that may be designed to optimize achievement of landscape and statewide objectives. For a full discussion on biodiversity pathways, see Appendix F.

The department uses chemicals in three primary silvicultural applications: site preparation, reducing competition from species in areas to be reforested; vegetation management, reducing competition from species after reforestation has been initiated; and to temporarily reduce impacts from insect epidemics. The first two involve herbicides and the last involves insecticides.

Site preparation and vegetation management are performed on more than one-half of all forest management units on forested state trust lands managed by the department and often more than one treatment is required. Some competing vegetation or weed species may be reduced to acceptable levels by leaving an overstory of trees when harvesting timber. However, this approach is often counterproductive in that it precludes successful reforestation and vigor of planted seedlings and is, therefore, generally not considered. Other weed species may be treated by manual slashing during a period each year when growth hormones are entirely in the crowns of the target species and thus, re-sprouting is precluded. Other weed species, however, do not have such a period and respond to manual slashing by accelerating growth. The latter can be controlled by herbicides.

Insect epidemics occur sporadically, but often with serious consequences. As discussed in the Forest Health policy subject area, forest insects occupy natural niches in the forest ecosystem when present endemically. However, when forest insect populations reach epidemic proportions, the subsequent fire danger from dead and dry trees can pose an unacceptable hazard to human life, resources and property. In order to stave off outbreaks in high risk forests for a year or two before converting them to a more healthy condition, insecticide applications are sometimes the best short-term approach.

Between fiscal years 1999 and 2003, the department annually treated an average of 4,194 acres with aerial-applied herbicides and 3,891 acres with ground-applied herbicide. The department last applied aerial pesticides in fiscal year 2000 to 3,618 acres.

In the past, chemical fertilizer has been applied to forested state trust lands. Currently, chemical fertilizer is not applied, due to budget constraints. Fertilization is an investment that, if applied to sites proven receptive, generates positive returns both in terms of trust revenue and accelerated development of wildlife habitat. The department's application of chemical fertilizer has averaged 2,647 acres between fiscal years 1999 and 2003.

REGULATORY FRAMEWORK

The regulatory framework consists of the State Environmental Policy Act (RCW 43.21C), the Forest Practices Act (RCW 76.09), the federal Endangered Species Act (16 U.S.C. 1531 et seq.) implemented primarily through the department's *Habitat Conservation Plan* and the modified *Lynx Habitat Management Plan*. In addition, at the federal level, silvicultural application of chemicals is governed by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA—7 U.S.C. s/s 136 et seq. 1996). This act

provides federal control of chemical distribution, sale and use. Under the Federal Insecticide, Fungicide and Rodenticide Act, only chemicals certified and labeled for safe use by the United States Environmental Protection Agency may be used and only for the particular applications the agency has approved, and then only with conformance of the requirements specified on the chemical label. Furthermore, the act requires users to register chemical purchases and applicators to possess a current certification for the class of application they practice. Certification is delegated to the states under federal standards.

At the state level, the Washington State Department of Agriculture is responsible for ensuring that chemicals are used safely and legally. To this end, the Department of Agriculture performs a number of activities, including registering the pesticidal products in the state, investigating complaints of possible misuse, maintaining a registry of pesticide-sensitive individuals and administering a waste pesticide collection program. These duties are performed under the authority of the Washington Pesticide Control Act (15.58 RCW), the Washington Pesticide Application Act (17.21 RCW), the General Pesticide Rules (WAC 16-228), the Worker Protection Standard (WAC 16-233) and a number of pesticide and/or county-specific regulations. In addition, state Forest Practices Rules (WAC 222-38-020) translate these various legal requirements into rules that govern details of pesticide handling, storage and applications on forested state trust lands, particularly in regard to aerial application and protection of wetlands and riparian areas.

The primary regulatory framework that pertains to application of chemical fertilizer on forested state trust lands is found in the state Forest Practices Rules, which govern handling, storage and application of chemical fertilizers, with particular emphasis on aerial application in the vicinity of bodies of water. State Forest Practices Rules and department procedures require buffering of water bodies from application. Notification of the public of proposed aerial application is also required. Other requirements involve analysis of potential environmental impacts due to application of chemicals through SEPA.

The Federal Insecticide, Fungicide and Rodenticide Act encourages and the department practices Integrated pest management. Integrated pest management is a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks. In addition, SEPA requires site-specific analysis of the adverse environmental impacts of proposed actions.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

WESTERN WASHINGTON

Policy No. PO14-C was adopted for Western Washington by the Board of Natural Resources on September 8, 2004, as part of the sustainable harvest calculation decision. It canceled *Forest Resource Plan* Policy Nos. 11 and 30 for Western Washington only.

PO14-C GENERAL SILVICULTURAL STRATEGY APPLIED TO THE TIMBER RESOURCE BASE AVAILABLE FOR SUSTAINABLE HARVEST IN WESTERN WASHINGTON

DISCUSSION IN PO14-C

The department defines silviculture as the art and science of cultivating forests to achieve objectives. The department uses a flexible, site-by-site approach for evaluating and implementing silvicultural treatments, based on site specific, rotational or long-term analysis incorporating return on investment, variable biological conditions, and physical limitations. Site-specific silvicultural prescriptions include intensive activities such as improved planting stock, site preparation, fertilization, and thinning, as budgets allow at the time prescribed activities come due. Innovative silvicultural treatments may be used to create, develop, enhance, or maintain forest biodiversity and health. For example, the objective of the “biodiversity pathways” approach to silviculture, presented by Carey et al. (1996) is for simultaneous increases in production of both habitat and income. This approach may be used to create complex, multi-aged stand structures that sustain key forest stand elements to replicate vital ecological functions at the stand and landscape levels.

All silviculture strategies are applied within a context of specific stand-level or larger area objectives to achieve long-term sustainable flow of forest products, services and other relevant values. Stands whose progress toward objectives is below potential are generally chosen for management intervention. Stands selected for regeneration harvests include but are not limited to those that have a low possibility for a positive response to partial harvest regimes.

POLICY STATEMENTS IN PO14-C

The department will follow legal requirements in maintaining the greatest possible portion of the trust forest lands as on-base.

The department will provide professional management of forestlands through active stewardship of on-base lands. Active management of the land base will be carried out as an integral part of the department’s fiduciary responsibilities to achieve, on a landscape basis, a combination of forest structures that over time provide for broad and balanced economic, ecological and social benefits. The department will use intensive and innovative silviculture to guide the desired progression of stand development to simultaneously produce trust revenue and create structural diversity across the landscape.

The department will target over time 10 to 15 percent of each Western Washington *Habitat Conservation Plan* planning unit for old forests based on structural characteristics. In meeting these targets, Old growth Research Areas will continue to be deferred and existing old growth (as defined by the *Habitat Conservation Plan*) and older stands will be a priority focus in developing the *Habitat Conservation Plan* planning unit targets.

EASTERN WASHINGTON

Under Alternative 1 for Eastern Washington, *Forest Resource Plan* Policy Nos. 11 and 30 still apply.

***Forest Resource Plan* Policy No. 11, Managing On-Base Lands:** “The department will manage on-base forest lands at different levels of intensity depending on biological productivity and economic potential. Investment decisions will be made according to expected returns.”

***Forest Resource Plan* Policy No. 30, Silviculture Activities:** “The department will plan and implement silvicultural activities to meet trust responsibilities. In cases warranting special attention, the department will accept a reduction in current income or return on investment when the department determines it is necessary to provide extra protection for soil, water, wildlife, fish habitat and other public resources.”

STATEWIDE

Under Alternative 1, the following policies from the *Forest Resource Plan* apply in both Western and Eastern Washington and were not directly addressed as part of the Board of Natural Resources decisions on September 8, 2004.

***Forest Resource Plan* Policy No. 31, Harvest and Reforestation Methods:** “The department will select the harvest method which produces the best mix of current and long-term income, achieves reforestation objectives and integrates non-timber resource objectives identified in the *Forest Resource Plan*. Reforestation objectives must ensure adequate restocking, produce acceptable benefits to the trusts and protect public resources.”

***Forest Resource Plan* Policy No. 33, Control of Competing Vegetation:** “To prevent domination of crop trees by other vegetation, the department will select from these methods for controlling competing vegetation:

- No treatment.
- Non-herbicide.
- Ground-applied herbicide.
- Aerial-applied herbicide.

The department will consider the no treatment method first and then move sequentially down the list. The department will select the first method on the list which is both effective and produces an acceptable return on investment. A method lower on the list may be used only if it substantially outperforms other methods.”

***Forest Resource Plan* Policy No. 34, Fertilizing, Thinning and Pruning:** “The department will use fertilization, thinning and pruning on stands which will respond and produce an acceptable rate of return on investment.”

■ ALTERNATIVE 2 (DEPARTMENT'S RECOMMENDATION)

Under Alternative 2, these policy statements apply statewide. Alternative 2 modifies Policy No. PO14-C that was adopted by the Board of Natural Resources on September 8, 2004, by moving the policy statement related to old forests and old growth research areas to the Older Forests and Old Growth policy subject area in this Draft Environmental Impact Statement (EIS) and extending policies adopted by the Board of Natural Resources for Western Washington to Eastern Washington as well. Alternative 2 recognizes that the subjects addressed in *Forest Resource Plan* Policy Nos. 31, 33 and 34 are silvicultural “methods” or “techniques,” rather than policy statements. They specify harvest and reforestation methods; control of competing vegetation; and fertilizing, thinning and pruning as necessary to achieve a combination of forest structures over time, as well as to provide for balanced economic, ecological and social benefits.

Under Alternative 2, *Forest Resource Plan* Policy Nos. 11, 30, 31, 33 and 34 would discontinue. Alternative 2 directs the department to use intensive and innovative silviculture to achieve desired stand and landscape objectives in both Western and Eastern Washington. Alternative 2 best meets the applicable policy objectives by promoting use of professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5) through active, innovative and sustainable management of all forested state trust lands (Policy Objective 7).

■ POLICY STATEMENTS

The department will follow legal requirements in actively managing the greatest possible portion of forested state trust lands.

The department will provide professional management of forest lands through active stewardship of forested state trust lands. Active management of the forest land base will be carried out as an integral part of the department’s fiduciary responsibilities to achieve, on a landscape basis, a combination of forest structures that over time provide for broad and balanced economic, ecological and social benefits. The department will use intensive and innovative silviculture to guide the desired progression of stand development to simultaneously produce trust revenue and create structural diversity across the landscape.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

For impacts associated with the first two policy statements under Alternative 1 for Western Washington, see the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*.

The risk of adverse impacts to the environment are increased under Alternative 1. Alternative 1, in retaining *Forest Resource Plan* Policy Nos. 31 and 34, attempts to provide a site-specific and outcome-oriented approach to managing the department’s

forested state trust lands. In doing so, Alternative 1 mandates techniques and field craft, rather than outcome-oriented processes. This results in something less than a landscape scale approach to silviculture. This approach will most likely focus on stand-level technical proficiency, while meeting the need for revenue over landscapes, at the expense of achieving desired conditions for wildlife, forest health, water and soil. Alternative 1 sacrifices strategic landscape objectives for activity or unit objectives. As a result, activity objectives are construed without comparison to strategic landscape objectives. Examples include: planting a standard number of trees per acre, regardless of objective-based rotational outcomes and biological productivity of the specific site; thinning at a prescribed age to a routine stand density, without regard to rotational site objectives; and foregoing control of invasive vegetation, because techniques rather than outcomes are dictated. An increased risk of impacts to the natural environment are expected under Alternative 1 from *Forest Resource Plan* Policy Nos. 31 and 34. Impacts from *Forest Resource Plan* Policy No. 33 would continue to be minimized and mitigated through the Integrated pest management approach.

For Alternative 1, the same risk of adverse impacts are true for Eastern Washington, except that generally lower site productivities make forest management decisions more critical. While the policy statements under Alternative 1 imply rotational outcome-based approaches to stand management, the policy statements provide little guidance.

Although under Alternative 2 the targeted objectives of *Forest Resource Plan* Policy Nos. 31, 33 and 34 are administered through department procedures, any consideration for amending the procedures will be reviewed as a separate action under SEPA.

The risks of adverse impacts to the environment are expected to be less under Alternative 2, because statewide and landscape scale strategic objectives are considered and integrated into site and stand-level silviculture treatments. In any one landscape, the beneficial environmental effects of Alternative 2, particularly in landscape-level ecological services, such as wildlife diversity, habitat complexity and hydrologic processes, are more likely to occur than under Alternative 1. By including landscape and broader scale concerns and needs in silvicultural planning, Alternative 2 will more likely avoid or mitigate effects of large stand-replacing fires, insect outbreaks or other extreme natural events than Alternative 1. Although complete avoidance of the effects of broad-scale extreme events is not possible, Alternative 2 will provide increased mitigation of potential adverse impacts to plants, wildlife species and habitats, water quantity and quality, and soils than Alternative 1, by integrating stand-level activities into the realities of naturally-occurring landscape-level processes. For example, silviculturally treating stands most likely to initiate insect outbreaks or treating stands to reduce fuel ladders can reduce fire spread and severity. The moderation of the extremes under Alternative 2 mitigates probable significant adverse impacts to well-functioning ecosystems.

CUMULATIVE IMPACTS

In managing for multiple objectives, the department seeks to manage landscape mosaics where the pieces are forest management units (stands) or smaller. Nature operates at all scales, without artificial boundaries from cataclysmic scale at a multi-century to multi-millennium interval, to smaller scales at more frequent intervals. The resulting ecosystem

function and species populations often fluctuate beyond an acceptable range of variation to meet statewide or area-specific objectives. By managing mosaics, the department seeks to moderate extreme events, especially fire and pathogen epidemics, by managing forests to meet multiple objectives and values at a constant rate, by manipulating the forest at the stand level. Thus, the department seeks to perpetuate relatively stable and viable ecosystems within their natural range of variability. To accomplish this, it is necessary to define outcomes (e.g., specific wildlife habitats, revenue for the trusts, visual management, etc.) and to implement forest management unit silvicultural prescriptions that achieve the outcomes. These outcomes must be synchronized so that any and all activities support rotational forest management unit (stand) objectives, which in turn support desired balances and spatial arrangements over landscapes.

Alternative 1 mitigates probable significant adverse impacts caused by isolated activities by limiting or promoting certain techniques. However, none of the policy statements have direct linkage to landscape management. In fact, Alternative 1 fails to provide a viable mechanism for linking individual projects to management of cumulative impacts over landscapes e.g., Policy No. 11 links management intensity to return on investment, but not to ecosystem maintenance over landscapes. The landscape concepts therefore, did not translate into practical silvicultural means. Alternative 1 assumed that silvicultural techniques constrained by outdated assumptions applied across landscapes at the scale of individual project activity would produce desired benefit at larger scales.

Alternative 1 addresses cumulative impacts by mitigating the likelihood of significant adverse impacts at the activity level. Alternative 1, however, likely constrains individual activities in such a way that broader landscape objectives become unattainable or may even be adversely affected. For example, financial inability to control undesirable vegetation likely delays attainment of desired wildlife habitat structure at the stand level, thereby affecting habitat needs at the landscape level. Thus, Alternative 1 increases the risk of adverse impacts to achieving Board of Natural Resources outcomes and state and federal policy outcomes for achieving enduring, viable ecosystems for native species.

Alternative 2 benefits from being fully integrated into a landscape-level sustained harvest implementation process. With the current state of knowledge, a system of site-specific silvicultural prescriptions, wherein rotational objectives (derived from broader-scale plans and policies within the potential of each specific forest management unit) steer management practices toward the best possible achievement of these objectives. Integrating unit-by-unit objectives with landscape-level processes over space and time mitigates probable significant adverse cumulative impacts from individual projects.

Alternative 2 emphasizes an overall vision of long-term, viable landscape-level ecosystems for native species and other ecosystem values by dovetailing silvicultural policies into a landscape-level system of planning and implementation. This system addresses the potential for significant adverse environmental impacts from activities not only during the operation, but over landscapes and through time. The outcome sets the stage for beneficial effects on the environment. As envisioned, habitats for threatened and endangered species are restored and social concerns are addressed against ecological and economic scientific knowledge. For example, frequency and timing of creating openings

in the forest canopy or use of forest chemicals, primarily herbicides and fertilizer, will be implemented, postponed or avoided based on their likelihood of achieving desired outcomes over time and space. Alternative 2 provides linkages between silvicultural policies and landscape scale strategies to reduce risk for significant adverse cumulative impacts and to increase significant beneficial cumulative impacts.

3.4.3 Forest Land Transactions

INTRODUCTION

State law and the department's *Asset Stewardship Plan* provides overall guidance for land transactions, including forest land transactions. Forest land transactions include selling, purchasing and exchanging lands, and acquiring and granting rights of way and easements. Transactions are critical for improving the performance of the forest trust asset by upgrading its productive capacity and reducing management costs and improving the department's ability to meet ecological objectives, including protection of special ecological features.

AFFECTED ENVIRONMENT

The department uses land transactions to maintain and improve the quality, value and productive capability of forested state trust land assets. In general, the goal is to dispose of properties that are unproductive or underperforming and replace them with others of higher quality and better capacity to produce income for the trust beneficiaries, both in the short and long-term. Many of the properties identified for disposal have attained higher and better use characteristics, which may increase their value, but render them unsuitable for resource management by the department. In addition, forest land transactions allow protection of special ecological features through transfer out of trust ownership, when full compensation to the trust(s) is secured.

The trust land base is strongly dominated by forestry holdings, both in terms of acreage and value, so diversifying over time into other asset classes is a key goal in selecting replacement properties. The department's repositioning strategy aims to reduce financial risk and increase prospects for immediate income, typically through agriculture and commercial property leases. The department's internal Asset Management Council directed that for fiscal year 2003-2005, one third of acquisition funds should be used to purchase commercial agriculture properties, one third for commercial properties and one third for protecting and enhancing existing assets, i.e., by purchasing in-holdings within forest blocks and making infrastructure investments.

In addition to diversifying into non-forestry asset classes, the department uses transactions to upgrade holdings within asset classes to produce higher rates of return. For example, low site or high operational cost forest land has been sold or exchanged for higher site or lower operational cost forest land. Table 6 summarizes transaction activity over the last 20 years.

Table 6: Trust Land Transactions by Asset Class (Fiscal Year 1984 to Fiscal Year 2004) *					
	Acres Disposed	Value Disposed	Timber Value to Common Schools	Acres Acquired	Value Acquired
Ag/Grazing	17,495	\$3,610,335	NA	11,331	\$15,746,477
Grazing Converted to Conservation Use	5,227	\$728,900	NA	NA	NA
Commercial **	360	\$21,601,215	NA	37	\$57,600,000
Forest Management	21,935	\$162,438,424	NA	NA	NA
Forest Converted to Conservation Use ***	45,361	\$32,241,300	\$137,144,500	70,456	\$214,187,546
Higher & Better Use	9,440	\$53,402,725	\$31,812,000	364	\$27,400
Total	99,818	\$274,022,899	\$168,956,500	82,189	\$287,561,423
<p>* Monies received from disposal of trust land are used to purchase replacement properties, which may be in any of the asset classes. Disposals from a particular asset class are not necessarily reinvested into the same asset class.</p> <p>** Disposals are primarily undeveloped commercial acreage and acquisitions are developed commercial properties.</p> <p>*** Forest Converted to Conservation Use value disposed includes Trust Land Transfer timber value deposited into the Common School Construction Account.</p>					

REGULATORY FRAMEWORK

Significant legal authorities from the Enabling Act, the State Constitution, common law and the statutes are available to the department, which are designed to enhance the stewardship of lands through transactions. The regulatory framework established by these legal authorities direct the department in protecting, diversifying, repositioning and making the lands productive in perpetuity. These tools include the Land Bank, statutes permitting sales followed by replacement and exchange statutes.

The Land Bank was established in 1977 under Chapter 79.66 RCW. Proceeds from permanent dispositions of granted lands under constitutional provision and statutes are deposited in permanent funds. The Land Bank statutes provided a formal mechanism for trust lands to be sold and replaced, so that no permanent disposition of lands is made. This is used to sell lands which have low potential for natural resource management, low income generating potential or which, because of geographic location or other factors, are inefficient for the department to manage. The Legislature has found that it is important to acquire lands for long-term management and to replace those sold, so that the publicly-owned land base will not be depleted and the publicly-owned forest base will not be reduced. Additional limitations state that it cannot be used as an exercise of eminent domain acquisition of property and the total acreage held in the Land Bank is not to exceed 1,500 acres. The purpose of the RCW is to provide a means to facilitate such sales and purchases, so that the diversity of public uses on the trust lands will be maintained. In

making these determinations, the department is to comply with local land use plans and applicable growth management principles. By statute, the lands to be purchased are to be desirable for addition to the public lands of the state, because of the potential for natural resource or income production of the property. The RCW also allows for certain exchanges for other property which have greater potential for natural resource production, income production or which could be more efficiently managed by the department.

Appropriation may be made from the Forest Development Account or the Resource Management Cost Account for the purposes of this RCW. The RCW also created a Land Bank Technical Advisory Committee to provide professional advice and counsel to the Board of Natural Resources regarding Land Bank sales, purchases and exchanges involving urban property. At intervals to be determined the Board of Natural Resources, the department is to identify trust lands which are expected to convert to commercial, residential or industrial uses within ten years. The Resource Management Cost Account was established in 1992 in RCW 43.30.265 to hold funds received in payment for transfers in lieu of condemnations, transfers to public agencies and transfers to resolve trespass and property ownership disputes, permitted under RCW 79.01.009. "Public agency" is broadly defined and includes the United States and any Tribe recognized by the federal government. The proceeds are to be used to buy replacement property for the affected trust in order to maintain the real property asset base managed by the department. The account is to be used to complete transactions without reducing the real property asset base. RCW 79.01.009 allows for direct transfers or sales without public auction only after appraisal for at least fair market value and only if the transaction is in the best interest of the state or affected trust.

These two innovative programs provide the department with significant opportunities to purchase specific parcels of trust lands, transfer them to their highest and best public use, and acquire replacement land better suited to be managed for the trusts (see RCWs 43.30.115, 43.30.265 and 43.51.270). Areas desirable for recreation or of natural significance, such as intact ecosystems which could not be effectively managed for long-term income production, are purchased from the trusts with State-General Fund monies and replaced with more suitable lands.

Currently, the focus is on Common School lands. The largest portion of the value of lands which has been included in this program consists of the timber value. When a transfer is made with State-General Fund money, the timber value is deposited in the Common School Construction Account. The land value is retained by the department to acquire replacement land. This is to comply with the intent to maintain the land base of the affected trusts.

Over the past 35 years, the department has completed land exchanges encompassing more than a half million acres of forest land in Western Washington. The vision and result of this large repositioning effort was to consolidate or "block up" department-managed lands to achieve management cost reductions through increased efficiency. The department's partners in these exchanges have typically been other large forest landowners and the federal government.

The Legislature adopted exchange authority for State Forest Lands in 1937 and for trust land in general in 1957. Exchanges are carried out to better position the trust land base within the regulatory constraints of maintaining the state land and commercial forest base. As with all transactions, exchanges are subject to approval by the Board of Natural Resources.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 reflects current practice and is consistent with state law and guidance in the *Asset Stewardship Plan*.

POLICY STATEMENTS

***Forest Resource Plan Policy No. 1, Federal Grant Land Base:* “The department will maintain a diversified base of Federal Grant lands, including nonforest properties. In deciding whether to sell, exchange or acquire lands, the department will balance current economic returns and trust benefits with future economic returns and trust benefits.”**

***Forest Resource Plan Policy No. 2, Forest Board Land Base:* “The department will perpetuate a productive forest base of Forest Board lands. In deciding whether to exchange lands, the department will assess whether timber harvesting is impractical on these properties and, if so, will attempt to replace them with productive forest lands.”**

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 recommends no policy in the *Policy for Sustainable Forests* related to forest land transactions, as policy direction is already provided through state law and the *Asset Stewardship Plan*.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Most sales, transfers and exchanges of land, and purchases of land are categorically exempt from SEPA review, because they are not the type of activities that have probable significant adverse environmental impacts (see WAC 197-11-800(5)).

Any adverse environmental impacts, including cumulative adverse impacts, of these policy alternatives are speculative and, therefore, not analyzed in this Draft EIS.

However, the SEPA Rules recognize the potential for adverse impacts from the sale, transfer or exchange of publicly-owned land that is subject to an authorized public use. Individual SEPA review will be done for any project specific transactions where there is an authorized public use.

CUMULATIVE IMPACTS

See the Significant Impacts and Mitigation Measures discussion.

3.4.4 Roads

INTRODUCTION

The department repairs and maintains about 14,000 miles of forest roads statewide (12,000 on forested state trust lands and 2,000 on other non-department lands), building approximately 150 miles of new road each year. Estimates done in 2004 from the department's Forest Practices Transportation Layer indicate there are 12,000 statewide road miles on department-managed lands, with just over 8,000 miles of road in Western Washington (see the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, Road Density Analysis, Chapter 4, Section 4.6.3, incorporated here by reference). The department abandons roads that are no longer needed for management purposes.

Timber harvest, fire control and recreation activities all generate traffic on department forest roads. The largest single source of traffic is associated with the department's management of forested state trust lands, although public access and recreation access may be a large use in some areas. Traffic from these activities extends from the network of the department and private forest roads onto county roads, as well as state and interstate highways. County and state roads are affected to varying degrees by logging trucks and other traffic generated from timber harvesting and forest management activities on forested state trust lands, as well as timber harvesting on other types of land ownership.

Roads also increase the value of the asset. The road system provides a variety of social benefits, including recreational access and access to private forest lands and residences. Roads, if not properly managed, also have the potential to cause increased costs and risks by damaging the environment or providing opportunities for illegal activities on forested state trust lands. The department carefully weighs the impacts of roads with regards to environmental protection, public use and forestland management needs. Where appropriate, roads are abandoned. Where appropriate, the department uses alternative harvest systems to minimize road density (roads/square mile).

Road-spacing is mostly dependent on topography. Topography drives the type of logging system used to achieve the desired silvicultural objectives, which in turn dictates optimal yarding distance to road-spacing combinations.

The following Policy Objectives apply to this policy subject area:

- Meet all state and federal laws, including the trust obligations and the contractual commitments of the *Habitat Conservation Plan* (Policy Objective 1);
- Balance trust income, environmental protection, and other social benefits from four perspectives: the prudent person doctrine; undivided loyalty to and impartiality among the trust beneficiaries; intergenerational equity; and not foreclosing future options (Policy Objective 2); and

-
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5).

AFFECTED ENVIRONMENT

The department's current method of road inventory utilizes the Forest Practices Transportation Layer in the department's geographic information system. The department is complying with the state Forest Practices Rules' Road Maintenance and Abandonment Plan requirement to have all of its forest roads inventoried, environmental issues assessed and maintenance and abandonment activities prioritized by December 2005. The department estimates that approximately 12,000 miles of road exist on state land, with an additional 2,000 miles of easements on other lands. Most of these roads have a gravel surface and are 12 to 16-feet in width. A geographical information system study in 1996 estimated that the department's road system accessed approximately 70 percent of forested state trust lands. It is expected that 3,500 miles of additional roads will be necessary over the next 20 years to access the remaining forested land base so the department can achieve the sustainable harvest level. Currently, the department abandons approximately 150 miles of road per year and will likely continue that trend for the next ten years, for a reduction of 1,500 miles of road. This range of alternatives does not consider, nor do they affect, the net increase in road miles necessary to access the remaining forest land base. The net amount of roads over the near and long-term is determined by the access needed to meet the Board of Natural Resources adopted sustainable harvest level, *Habitat Conservation Plan* targets and state Forest Practice Rules, which have all undergone the SEPA EIS analysis process and are incorporated by reference in this Draft EIS. None of the alternatives modify the targets in the sustainable harvest calculation and the *Habitat Conservation Plan*. Any new roads required to achieve Board of Natural Resources policy objectives are reviewed under SEPA at the time that subsequent plans are developed for specific geographic planning areas.

There have been a number of accomplishments related to roads management since the *Habitat Conservation Plan* was implemented. These include:

- Baseline inventory of roads completed in December 1999;
- Inventory of all stream crossings and assessment and prioritization of culvert fish blockages completed in April 2001;
- 223 fish blockages repaired or abandoned;
- 907 miles of road decommissioned or abandoned;
- *Habitat Conservation Plan* guidelines for assessment of potentially unstable slopes completed in September 2003; and
- As of December 31, 2003, approximately 75 percent of the *Habitat Conservation Plan* planning unit road assessments have been completed under the approved Road Maintenance and Abandonment Plans, according to Forest and Fish regulations. The law required the department, at the end of 2003, to be 60 percent complete.

Roads can potentially affect water quality, hydraulics, wildlife habitat, unstable slopes, native plant species, aesthetics and public access and recreation in several ways. A number of processes are important to understand the potential for adverse environmental impacts to these elements. The processes include mass wasting, surface erosion and changes in soil productivity.

The primary concern about roads is the amount of sediment that is delivered to streams. The amount of impact is dependent on construction techniques; proximity to streams; parent soil types; surfacing type; cross drain culvert spacing and location; and quality and frequency of maintenance and road use.

Management activities that potentially increase the risk of mass wasting include road building (*Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, pages 3-29 to 3-31). Careful road planning can reduce the risk of mass wasting due to management activities and its effects. Sediment produced as a result of use of roads can be delivered to the aquatic system from episodic landslides initiated as a result of poor road construction and maintenance.

The role of mass wasting in aquatic systems is described in more detail in the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources* (pages 3-7 to 3-25) and incorporated here by reference. Potential impacts from road-building and timber harvest are minimized through effective planning, design and review of appropriate harvest practices on all non-federal lands in Washington, with special requirements on unstable or potentially unstable slopes. Roads can have a significant influence on unstable slopes, due to the interception and redistribution of normal groundwater patterns and interruptions of precariously steep ground slopes in unstable soil types.

Generally, forest vegetation stabilizes soils, reduces soil erosion and slows sediment transport to streams, thereby minimizing the impact of sedimentation on water quality. However, surface erosion from roads, harvest units and skid trails tends to be a chronic source of fine sediment to the drainage network, as well as an episodic source of coarse sediment. Chronic sources of fine sediment can have potentially significant adverse effects on the physical habitat of the aquatic system and certain lifestages of aquatic biota, degrade water quality and affect soil productivity in both riparian and upland areas.

Road-related surface erosion and delivery of fine sediments to streams is a concern, because of the thousands of miles of forest roads that exist to transport harvested timber and other forest products in forested regions. Surface erosion is affected by slope gradient and shape, soil texture properties (density, cohesion, sorting, etc.), parent material, precipitation, groundwater movement, vegetation cover and human activities. Rates of sediment delivery to streams, predominantly from timber haul (heavy truck traffic), but also public use of unpaved roads is correlated to traffic volume, design and maintenance of the road and associated drainage structures, and the location of the road relative to streams (United States Department of Agriculture Forest Service, 2001; Rashin et al., 1999; Reid and Dunne, 1984). The amount and types of traffic and road maintenance practices also influence delivery.

As indicated in Table 4.6-3 in the *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*, much of the department's current land base is already actively managed (70 percent), already accessed by roads and is used for a variety of land management purposes, including harvesting timber and other forest products, recreation, silviculture and wildfire suppression, all of which are factors in the sediment production and delivery processes.

In assessing road surface erosion, sedimentation processes are more of a complex factor than the number of truck miles driven on the roads. Topography, aspect, surface materials, construction/maintenance techniques, proximity to a riparian area, micro-climates, time of year, storm events and public access play a role in sedimentation. Roads that have not yet been updated to be in compliance with the state Forest Practices Rules are at greater risk for sediment production than those that have been updated. One of the objectives of the Road Maintenance and Abandonment Plans is to have roads constructed in a manner that prevents the delivery of sediment to stream, regardless of levels of traffic.

The department has performed analyses of existing road management and road-related impacts. Analysis of the strategies from the *Habitat Conservation Plan*, pages IV.77 to 78, and the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, pages 3-29 to 3-31, hereby incorporated by reference, are outlined as follows:

- Roads can affect the surface water hydraulics by intercepting, concentrating and rerouting normal runoff patterns;
- Roads and the stream-crossing structures they incorporate can have an impact on fish, mammal, and riparian obligate species, migration corridors and to a limited extent, disturb and displace species through introduction of human activity;
- Road building can affect soil productivity. Factors involved include road location relative to sensitive soils and soil moisture, type, area and frequency of disturbance, e.g., skid roads;
- Roads can facilitate the introduction of non-native plant species into the forest environment; and
- Roads can have visual impacts. This perspective is amplified when high road densities are coupled with large contiguous harvest units visible from populated locations on state and local highways.

Many of the department's forest roads are used to access department-managed lands for a variety of recreation activities, involving both developed facilities and trail systems, as well as for more dispersed activities such as hunting, fishing and sightseeing. The department receives a small amount of funds from the Off-Road Vehicle Account for road maintenance to support public access. In addition, some developed recreation sites are leased to the Interagency Committee for Outdoor Recreation, with access provided via department-developed roads. Changes to the road system can have an impact to the

recreational activities to which those roads provide access. The biggest potential significant adverse impact comes from loss of recreational opportunities due to road closures and abandonment. However, this potential is often mitigated by road relocation, i.e., abandon the stream-adjacent road and relocate it to the top of the ridge.

REGULATORY FRAMEWORK

The basic structure of *Habitat Conservation Plan* commitments for forest roads is stated in the *Riparian Conservation Strategy for the Five Westside Planning Units*, Part IV, Section D. The department committed to the following principles for road network management:

- Minimization of active road density;
- Site-specific assessments of alternative harvesting systems that require less road construction;
- A baseline inventory of roads and stream crossings;
- A prioritized system for road decommissioning and abandonment, upgrading and maintenance; and
- Identification of fish blockages caused by stream crossing structures and a prioritized approach to repair or remove.

In addition, the state Forest Practices Act (RCW 76.09) regulates the department. This act contains many sections designed for protection of the environment. The Forest and Fish regulations were passed into law after the department's *Habitat Conservation Plan* agreement and have significantly raised the level of environmental protection with respect to road management, unstable slopes and fish blockage repair. Additionally, each road that is constructed is further evaluated under SEPA as a part of the department's review of timber sale projects occurring on forested state trust lands. State Forest Practices Rules cover all phases of roads, from planning to abandonment.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 essentially directs the department to plan, build, construct, control, maintain and abandon roads to support proprietary activities and provide for multiple use, in compliance with state law and Board of Natural Resources policy. While adopted prior to the *Habitat Conservation Plan*, it also directly supports the *Habitat Conservation Plan* commitments. Alternative 1 focuses on reducing the total amount of roads through coordination and cooperation with other landowners; using the most cost-efficient road construction and maintenance methods that meet applicable laws, contractual requirements and Board of Natural Resources policy; controlling adverse environmental impacts of roads, including road closures; and building and maintaining roads to meet or

exceed safety standards for the uses intended, including multiple use. Alternative 1 meets Policy Objective 1, but doesn't appear to meet Policy Objectives 2 and 5 as well as other alternatives.

POLICY STATEMENT

Forest Resource Plan Policy No. 28, Developing and Maintaining Roads: “The department will develop and maintain a road system which integrates management needs and controls effects on the forest environment.”

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 primarily directs the department to plan, build, construct, control, maintain and abandon roads to support trust objectives, including enhancing asset value. Alternative 2 deemphasizes multiple use as a management objective. Alternative 2 relies on compliance with state and federal law, including meeting the contractual commitments in the *Habitat Conservation Plan*, to control the environmental impacts of the road system on forested state trust lands. Unlike Alternative 3, Alternative 2 does not specifically address the issue of road density. Alternative 2 meets Policy Objective 1 and meets Policy Objectives 2 and 5 as well as Alternative 3.

POLICY STATEMENTS

The department will develop and maintain roads to meet trust objectives, including enhancing asset value.

The department will, in developing and maintaining roads, rely on the requirements of the *Habitat Conservation Plan*, state Forest Practices Rules and the State Environmental Policy Act to minimize adverse environmental impacts.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 includes all of the components of Alternative 2, while specifically adding the commitment to minimize the road network. This would require a more active effort to do long-range forest land planning to ensure the minimum road network needed to meet trust objectives. Alternative 3 also commits the department to a more aggressive program of abandoning roads to minimize environmental impacts and reduce road-associated costs. Alternative 3 best meets the applicable policy objectives, as it meets the requirements of the *Habitat Conservation Plan* (Policy Objective 1) and allows use of professional judgment and best available science in designing, constructing and maintaining a road system that is both cost-effective and environmentally compatible (Policy Objectives 2 and 5).

POLICY STATEMENTS

The department will develop and maintain roads to meet trust objectives, including enhancing the asset value.

The department will, in developing and maintaining roads, rely on the requirements of the *Habitat Conservation Plan*, state Forest Practices Rules and the State Environmental Policy Act to minimize adverse environmental impacts.

The department will, to the greatest extent possible, minimize roads on forested state trust lands while still meeting the needs of each trust beneficiary.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Alternative 1 meets state Forest Practices Rules for environmental standards on all state lands and a higher environmental standard for those lands covered by the *Habitat Conservation Plan*. It is also assumed that Alternative 1 will continue the use of the expanded SEPA checklist on site-specific proposals for road construction.

The *Draft Environmental Impact Statement Habitat Conservation Plan* (pages 4-163 to 170) analyzes effects related to sediment and stream flow and is hereby incorporated by reference. Mitigation in the form of riparian management zones, management for hydrologically mature forest in the significant rain-on-snow zones, wetland protection and road management planning are detailed in those sections.

The following information is incorporated by reference. The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources* also presents an analysis of the effects of sediment, peak flows, roads in riparian areas and wetlands on water quality and on fish. A discussion of sediment is contained in Section 3.2, page 3-7, which discusses road surface erosion and road-related landslides. The evaluation of the alternatives in this analysis offers the 2001 rules package that provides measures necessary to address impacts due to road-related sedimentation (Section 3.2, page 3-16). These mitigation measures include implementation of road maintenance and abandonment plans and the adaptive management program. In addition, the *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, Appendix F, page F-2, discusses the effects of road construction and maintenance and describes recommended and accepted practices for building and maintaining roads. It states that, "Roads built following Forest Practices Rules that provide specific direction and recommended Best Management Practices (BMPs) from the literature have the lowest risk of causing sediment delivery."

The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, page S-9, cites the following impacts: "Alternative 2 [which was adopted by the Forest Practices Board and is the current Forest Practices set of rules] would produce a low to moderate risk of fine sediment delivery primarily because of 1) an outcome-based policy incorporated into the forest road rules that directly addresses the desired outcome of avoiding resource damage, 2) improved rules and best

management practices that address road drainage, 3) required development and implementation of road maintenance and abandonment plans within 15 years, and 4) a minimum of a 30-foot equipment limitation zone required on all streams.”

The *Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources*, page S-10, cites the following impact: “Alternative 2 [which was adopted by the Forest Practices Board and is the current Forest Practices set of rules] would also produce a moderate risk of timber-management-related increases in peak flows because watershed analysis would likely be conducted with less frequency, and no other rules would directly address cumulative watershed harvest. Road drainage to streams would, however, be reduced through strengthened rules, and best management practices and road maintenance and abandonment plans would be implemented.” However, on department lands in Western Washington covered by the *Habitat Conservation Plan*, the department maintains hydrologic maturity in the rain-on-snow zones. This mitigates any probable significant adverse environmental impacts related to surface hydraulics.

The department evaluates slope stability and other geomorphologic interactions during site-specific timber sale and road design. A significant part of the evaluation is the use of the expanded SEPA checklist, which adds approximately 100 additional considerations to the original checklist. These considerations focus on environmental issues associated with forest management, including road construction. An understanding of interactions among geology, climate, ecosystems and management activities can lead to informed decisions and balanced actions that minimize significant adverse environmental impacts.

Impacts from noxious plant species are discussed in this Draft EIS under the Forest Health policy subject area and impacts related to aesthetics are discussed under the Visual Management policy subject area.

Alternative 1 perpetuates the current level of roads available to the public for access and recreation. Alternative 1 also directs the department to build and maintain a road system to support management needs, including multiple use, while controlling effects on the forest environment. Roads are built to provide user safety and minimize potential environmental impacts. Alternative 1 does not specifically address the opportunities for recreational access provided on department roads, but does include multiple use as a goal in developing and maintaining roads on forested state trust lands. The focus of the department’s road system management has been to reduce the total number of miles of roads in keeping with its *Habitat Conservation Plan* obligations. While the overall reduction in miles of road can have an impact on access to department lands for recreational activities, past practice, prior to adoption of the *Habitat Conservation Plan*, has not included a pattern of aggressive road abandonment.

Recently, with the implementation of the state Forest Practices Rules and the *Habitat Conservation Plan*, the department has been more active in assessment of its road system and more roads have or will be abandoned to fulfill requirements. This represents an increasing potential impact to access provided to the public on department-managed lands. As some roads are closed and other new roads are constructed, there will be a

displacement of access and other recreational activities. However, the department would still be required to provide multiple use when compatible with trust requirements and would still be required to honor or renegotiate any lease commitments to the Interagency Committee for Outdoor Recreation potentially impacted by Alternative 1.

Alternative 2 provides the same level of environmental protection and the same level of environmental impacts as discussed above under Alternative 1. Alternative 2 deemphasizes multiple use as a management objective, which would potentially provide less public access to forested state trust lands. Consequently, Alternative 2 is closely tied to the Public Access and Recreation policy subject area in this Draft EIS.

Under Alternative 3, the evaluation of probable significant adverse environmental impacts and mitigation measures are essentially identical to Alternatives 1 and 2 for lands covered by the department's *Habitat Conservation Plan*. However, it specifically adds the commitment to extend the tools embedded in the *Habitat Conservation Plan* in order to minimize the road network in Eastern Washington. Alternative 3 commits the eastside regions to a higher level of standards for design, construction and maintenance than Alternatives 1 and 2. Since the Northeast and Southeast regions have approximately 33 percent of the road net statewide, the department could expect an increase in abandonment in those regions by an additional 40 miles per year over the next ten years. This additional abandonment effort represents approximately 3 percent of the current total road network statewide on forested state trust lands. Thus, under Alternative 3, a net reduction in the potential impacts to the elements of the natural environment, i.e., erosion, sediment, wildlife habitat and water, is anticipated.

Alternative 3 could also reduce the amount of roads available to the public on the current total road network by approximately 3 percent. As such, Alternative 3 has the greatest potential adverse impact to public access and recreation. As the department seeks to minimize roads on forested state trust lands, access opportunities for the public will potentially be reduced or displaced to areas of new road construction. A minimum road network managed strictly to meet trust objectives could include the abandonment of roads presently used primarily for access to recreation sites or trail systems, unless adequate and appropriate funding and resources were provided to mitigate environmental and economic impacts to the trusts. While the department does receive some funds from the Off-Road Vehicle Account for road maintenance to support recreational access, the amount is not sufficient to keep roads that provide access to many recreational sites open and maintained.

Many recreational sites were constructed along routes once used for forest or wildfire management, but the needs for the roads for forest management purposes are greatly reduced or no longer exist. The Recreation Program's current budget would not support management and maintenance of those roads and many could be closed under Alternative 3. However, this could result in a corresponding increase in management fund expenditures to enforce and maintain closures. Sites that were accessed by roads no longer needed for forest management would be closed and facilities removed, as the roads were abandoned. However, some recreational facilities were constructed and leased with grant funds. Any assessment of road system management should include an assessment of recreational site access and an accounting of lease obligations. The

department may have to weigh the cost of replacing or repaying lease values as access is eliminated due to road mile reduction, against the associated costs of road maintenance and enforcement of closures. When considered with the department's recommended alternative for Public Access and Recreation, public access would be provided on existing open roads, when there is adequate and appropriate management funding and support to ensure compatibility with trust objectives. However, Alternative 3, if combined with Alternative 2 for Public Access and Recreation, which emphasizes more road closures, may result in a significant adverse impact to recreational opportunities. Some mitigation would be provided for road relocation, e.g., roads adjacent to stream channels are relocated to where potential adverse impacts to the natural environment are avoided or minimized and recreational opportunities, although relocated, are somewhat retained.

CUMULATIVE IMPACTS

Under all alternatives, it is assumed that the department will continue use of the expanded SEPA checklist, as described under Alternative 1. The department will also review the impacts of its forest planning proposals, including road planning proposals, through its forest land planning process that includes review under SEPA. If a significant risk of cumulative impacts is determined through the forest land planning process, further analysis will be conducted to provide information for developing strategies that would mitigate the risk.

As mentioned in the Affected Environment subsection of this policy subject area, the following department documents are incorporated by reference:

Draft Environmental Impact Statement Habitat Conservation Plan, pages 4-163 to 170, discusses the impacts of sediment;

Final Environmental Impact Statement on Alternatives for the Forest Practices Rules for Aquatic and Riparian Resources, Appendix F. Forest Roads, pages F-1 through F-17, discusses the impacts from forest roads; and

Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington, Section 4.6 Geomorphology, Soils, and Sediment, pages 4-97 to 4-108, discusses surface erosion and mass wasting.

Refer to those publications for a complete discussion of the potential impacts and mitigation measures regarding forest roads.

3.4.5 Acquiring Rights of Way

INTRODUCTION

The department acquires land and rights of way across private and other public lands to facilitate management and to increase the value of the trust assets. The department acquires these rights of ways by gift, purchase, exchange, condemnation or road use agreements. In addition to the *Forest Resource Plan* policy, the department has one additional policy related to rights of way acquisition, which is titled Acquiring Access to Lands Managed by the Department.

AFFECTED ENVIRONMENT

The department acquires needed access to state lands by purchasing or exchanging land, easements or permits with adjacent landowners. Adjacent landowners may be non-industrial private landowners, other governmental agencies, industrial forest landowners or non-forestry related corporations.

In the past, the department has acquired access primarily from industrial forest landowners. Changing land use and increased development have resulted in the percentage of acquisitions needed from non-industrial forest landowners, accounting for more than 60 percent of total acquisitions. Normally, greater conflicts may arise between the uses proposed by the department with a non-industrial forest landowner than with a timber industry landowner, thus making access more difficult to negotiate.

Access can be needed over any type of land. Most access is acquired by easement. Legally, the easement holder (the department) is responsible for the maintenance of the access road, unless the easement document states otherwise. Most easements obtained by the department provide for joint maintenance of the roads. When adjacent landowners were timber industry landowners with similar interests, this worked well. As more adjacent forest land has converted to private residences and non-timber industrial landowners, the department bears more of the responsibility for the maintenance work, as well as meeting requirements of the state Forest Practices Rules. The department is meeting this challenge by more fully evaluating the costs associated with easement roads in the short and long-term prior to obtaining access, as well as considering fee-simple acquisition of land.

Forest Resource Plan Policy No. 27, Acquiring Rights of Way, was a partial restatement of existing department-wide policies. Rights of way policies affect management of all department-managed lands, not just forested lands.

REGULATORY FRAMEWORK

There are a variety of statutes that govern the acquisition of rights of way. They include:

- Chapter 8.04 RCW Eminent domain by state;

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- RCW 79.10.140 Outdoor recreation -- Construction, operation and maintenance of primitive facilities -- Right of way and public access -- Use of state and federal outdoor recreation funds;
 - RCW 79.38.010 Acquisition of property for access to public lands;
 - RCW 79.38.020 Exchange of easement rights;
 - RCW 79.36.310 Acquisition of property interests for access authorized;
 - RCW 79.36.320 Condemnation -- Duty of attorney general; and
 - RCW 79.36.340 Acquisition -- Payment.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Acquiring rights of way is already addressed in another department policy, making this policy redundant.

POLICY STATEMENT

***Forest Resource Plan Policy No. 27, Acquiring Rights of Way:* “The department acquires right of way across private or other public lands to department-managed forest land when this access is needed to increase the value of trust assets or for management purposes. The department will acquire these rights of way by gift, purchase, exchange, condemnation or road use agreement. Permanent, public access rights are preferred.”**

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 recommends no policy in the *Policy for Sustainable Forests* related to acquiring rights of way, because this subject is already addressed in other department policies and in governing statutes.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Acquiring of any right to real property is categorically except from SEPA review, because it is not the type of activity that has significant adverse impacts (see WAC 197-11-800(5)(a)). The impacts to the environment rests with the characteristics of each individual acquisition. Department access needs are evaluated on numerous factors, including environmental impacts. Existing roads are used whenever possible. Acquisition of access by the department normally results in an upgrade of an existing road to forest

practices standards and the incorporation of that road into the department's road system, resulting in regular maintenance.

CUMULATIVE IMPACTS

There are no cumulative adverse impacts identified for these policy alternatives (see the Significant Impacts and Mitigation Measures discussion).

3.4.6 Granting Rights of Way

INTRODUCTION

The department recognizes that other entities may need rights of way across forested state trust lands. Permanent and temporary rights of way include grants or easements for utility, domestic use, timber haul and other purposes. In addition to the policy in the *Forest Resource Plan*, the department has six policies related to granting rights of way, which are titled Granting of Rights of Way – General; Issuing Domestic Use Road Easements; Granting Rights for County Roads; Granting Utility Rights of Way; Term of Rights of Way Grants; and Charging for Rights of Way Grants.

AFFECTED ENVIRONMENT

The department grants rights of way across forested state trust lands for a variety of reasons, including what is required by law; in exchange for needed rights; to avoid legal action, such as condemnation; and when it does not conflict with trust land management. Almost all rights are granted by permanent easement, temporary easement or temporary permit. Rights are granted for public and private utilities, county roads, residential access, resource management and a myriad of other purposes. Access may be requested by adjacent landowners or by public entities for public purposes, such as county roads or transmission lines. Almost all parcels of land managed by the department are encumbered with some type of right granted to someone else.

Forest Resource Plan Policy No. 26, Granting Public Rights of Way, was a partial restatement of existing department-wide policies. Rights of way policies affect management of all department-managed lands, not just forested lands.

REGULATORY FRAMEWORK

There are a variety of statutes governing granting of rights of way. They include:

- Chapter 8.24 RCW Private ways of necessity;
- RCW 79.10.120 Multiple uses compatible with financial obligations of trust management -- Other uses permitted, when;
- RCW 79.36.350-650;
- RCW 79.38.020 Exchange of easement rights; and
- RCW 79.38.040 Permits for use of roads.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Granting rights of way is already addressed in other department policies, making this policy redundant.

POLICY STATEMENT

Forest Resource Plan Policy No. 26, Granting Public Rights of Way: “The department will grant rights of way to private individuals or entities when there is an opportunity for enhancing trust assets and when any detriments are offset.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 recommends no policy in the *Policy for Sustainable Forests* related to granting rights of way, because this subject is already addressed in other department policies and governing statutes.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Any adverse environmental impacts, including cumulative impacts, of these policy alternatives are speculative and, therefore, are not analyzed in this Draft EIS.

Issuance of rights of way, easements and use permits to use existing roads in non-residential areas is categorically exempt from SEPA review, because they are not the type of activities that have probable significant adverse environmental impacts (see WAC 197-11-800(25)(j)). Granting rights of way to construct new roads in any area or to use existing roads in residential areas are subject to SEPA review at the time of an individual proposal.

The impacts to the environment rest with the characteristics of each individual grant. Requests for rights of way are evaluated on numerous factors, including environmental impacts. Negotiation of rights of way terms and denials of high-risk applications are used to avoid or minimize environmental impacts. The department also works cooperatively with regulatory agencies and the applicant to design rights of way that limit environmental impacts.

CUMULATIVE IMPACTS

There are no cumulative adverse impacts identified for these policy alternatives (see the Significant Impacts and Mitigation Measures discussion).

3.4.7 Research

INTRODUCTION

The department engages and participates in a broad range of scientific and economic research to support department land management programs, financial performance and meet the research commitments of the *Habitat Conservation Plan*. This includes participating in a variety of research cooperatives with other agencies and organizations. The department employs scientists in a range of disciplines necessary to meet research and management needs, including forest ecology, silviculture, economics, hydrology, fisheries, wildlife biology and others.

The following Policy Objectives apply to this policy subject area:

- Meet all state and federal laws, including the trust obligations and the contractual commitments of the *Habitat Conservation Plan* (Policy Objective 1);
- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4); and
- Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship (Policy Objective 5).

AFFECTED ENVIRONMENT

The department has a Research Program to supply information to decision-makers, meet the research obligations of the *Habitat Conservation Plan* and increase confidence in new and existing management practices. The goal of research on forested state trust lands is to use new scientific information derived from research to guide changes in forest management to better meet trust objectives.

Department-sponsored research helps the department practice active and innovative forest resource management and react quickly to changes in technology and economics. Land management decisions made as a result of research can affect the soils, water and habitat for all species of plants, and vertebrate, invertebrate, aquatic and terrestrial creatures on forested state trust lands. Current research efforts, primarily focused in the Olympic Experimental State Forest *Habitat Conservation Plan* planning unit may not be relevant to management decisions in other *Habitat Conservation Plan* planning units, because of differences in forest composition, structure, growth and natural disturbance.

The department's research commitments under the *Habitat Conservation Plan* are necessary to obtain information to complete the riparian and marbled murrelet conservation strategies. Sound scientific information translates to an increase in both management confidence and management options. In addition, the science that describes the complex interactions between physical and biological parameters within ecosystems and our understanding of the long-term impacts of forest management activities on these processes is rapidly evolving. Risk and uncertainty remain with some aspects of the conservation strategies. For example, the effectiveness and cost of specific treatments to

accelerate habitat development or how best to manage potential windthrow in riparian management zones. The department, through research, is investigating alternatives to existing management that will more effectively meet the objectives of the *Habitat Conservation Plan* and the trusts.

Research conducted by the department applies to lands within seven different ecoregions. New information about resource condition, rate of change and management response must be placed within the appropriate ecological context. The emphasis on research and adaptive management is intended to lead to effective changes to the conservation strategies in the *Habitat Conservation Plan* planning units. However, due to the focus of research in the Olympic Experimental State Forest in the Northwest Coast ecoregion, it is difficult to apply results to other ecosystems, because of the differences in growth environment, stand composition and disturbance history between ecoregions.

The ultimate result of research is to evaluate the consequences of management practices and provide better alternatives for reaching the management objectives in a specific landscape context. Clearly defined objectives, faithfully conducted management and adequate monitoring and evaluation within the intended scope of the research is the best way to support decision-making and propose alternatives to more effectively meet management objectives.

REGULATORY FRAMEWORK

The Forest Practices Cooperative Monitoring Evaluation and Research group is a research partner. The purpose of the Cooperative Monitoring Evaluation and Research group is to provide science-based recommendations and technical information to assist the Forest Practices Board in determining if and when it is necessary or advisable to adjust rules and guidance to achieve resource goals and objectives. The forest practices research priorities are generally consistent with those of the *Habitat Conservation Plan*.

The department actively manages a Research Program to ensure that information is obtained in a timely and cost-effective manner and that research is accomplished with high standards of quality and credibility (*Final Habitat Conservation Plan*, page V.8). Research is a required activity under the *Habitat Conservation Plan* implementation agreement.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Forest Resource Plan Policy No. 40 required that the department practice state-of-the-art forest resource management and react quickly to changes in technology and economics. Through the use of professionals in the fields of forestry, economics, fisheries, soils, road engineering, hydrology, logging systems, wildlife management, public relations and other areas, the department conducted research to monitor and evaluate silvicultural activities, test current practices and, where appropriate, initiate a process for change. The

research focused on issues related to protection and conservation, as well as forest production.

Alternative 1 emphasizes research of a practical nature that is focused on efforts to increase the department's effectiveness as a manager of forested state trust lands. Alternative 1 focuses on department-conducted research and, because it was written prior to the *Habitat Conservation Plan*, does not include the research role of the Olympic Experimental State Forest. Also, it does not recognize the value of research cooperatives as an effective way to meet department research needs. Alternative 1 does not appear to meet Policy Objectives 1, 4 and 5 as well as other alternatives.

POLICY STATEMENT

Forest Resource Plan Policy No. 40, Research: "The department will conduct applied research to monitor and evaluate silvicultural activities, test current practices and, where appropriate, initiate a process for change. The research will focus on issues relating to protection and conservation as well as forest production."

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 includes all of the components of Alternative 1. In addition, Alternative 2 recognizes that the Olympic Experimental State Forest was created to allow the department flexibility to conduct management and research activities ecologically appropriate to the Olympic Experimental State Forest. The purpose is to build new knowledge relevant to trust management objectives and species conservation. The Olympic Experimental State Forest intends to find field-tested solutions to forest management issues related specifically to integrating production and conservation. Alternative 2 also recognizes the value of research cooperatives and the importance of a positive cost-benefit ratio in directing research on behalf of the trusts. Alternative 2 appears to better meet Policy Objectives 1, 4 and 5 than Alternative 1.

POLICY STATEMENTS

The department will conduct applied research to monitor and evaluate silvicultural activities, test current practices and, where appropriate, initiate a process for change. The research will focus on issues relating to protection and conservation as well as forest production.

The Olympic Experimental State Forest will be the focus of department research and experimentation efforts to meet the commitments of the *Habitat Conservation Plan*. The purpose is to build new knowledge relevant to trust management and species conservation.

The department will emphasize its participation in research cooperatives, meeting the research commitments of the *Habitat Conservation Plan*, and conducting research when there is a positive cost-benefit ratio to the trusts.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 includes all of the components of Alternative 2. In addition, it recognizes the importance of staying current with the latest scientific findings, methods and technology. Alternative 3 best meets the applicable policy objectives by meeting the research requirements of the *Habitat Conservation Plan* (Policy Objective 1), relying on research cooperatives to help achieve research objectives (Policy Objective 4) and guiding forest management strategies and activities on the best available science and professional judgment to achieve excellence in public stewardship (Policy Objective 5).

POLICY STATEMENTS

The department will conduct applied research to evaluate silvicultural activities, test current practices and, where appropriate, initiate a process for change. In addition, the department will research and evaluate new methods of forestry, silvicultural strategies and changes in technology. The research will focus on issues related to natural resource protection and conservation, as well as the sustained production of forest products.

The Olympic Experimental State Forest will be the focus of department research and experimentation efforts, when ecologically appropriate, to meet the commitments of the *Habitat Conservation Plan*. The purpose is to build new knowledge relevant to trust management and species conservation.

The department will emphasize its participation in research cooperatives, meeting the research commitments of the *Habitat Conservation Plan*, and conducting research when there is a positive cost-benefit ratio to the trusts.

The department will endeavor to stay abreast of and use the best available science.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Alternative 1 enables the department's research to supply specific information for influencing the timely completion of and future improvements to the department's management decision-making. Those decisions affect almost all elements of the environment, including the soils, water and habitat for all species of plants, and vertebrate, invertebrate, aquatic and terrestrial animals on forested state trust lands. Alternative management practices can be developed to better meet the department's conservation goals.

Adaptive management applies the concept of experimentation to the design and implementation of natural resource policies. Adaptive management is learning at time scales needed to accumulate understanding on an ecosystem, rather than sale-by-sale; manage ecosystems, rather than individual organisms; and is driven by a time scale of biological relevance, rather than business cycle (Lee, 1993). Alternative 1 fails to incorporate modern adaptive management principles or the framework to maintain ecological context for the information. It also fails to emphasize maintaining the

credibility of the scientists and their work for the department. As such, the effectiveness of applying the results of research to guide management decisions that will mitigate impacts to soils, water and plant and animal species under Alternative 1 may be compromised.

Alternative 2 adds significant opportunities for landscape or basin level research on the Olympic Experimental State Forest. The opportunities afforded by the Olympic Experimental State Forest could provide significant opportunities to meet the department research needs. Inherent in the Olympic Experimental State Forest guiding principles is the integration of timber production and conservation management objectives into research. Although Alternative 2 could result in research that has broader applicability across forested state trust lands and thereby greater minimization of impacts to soils, water and plant and animal species, it is not as explicit as Alternative 3.

Alternative 3 increases the sophistication of adaptive management, broadens the scope of research to the entire geographic area to which it might be eventually applied and allows the Olympic Experimental State Forest to be fully utilized.

Alternative 3 recognizes a benefit over Alternatives 1 and 2 in the role of research cooperatives in controlling cost and increasing the scope of the applicability of results, which in turn is expected to result in less risk of adverse impacts to the environment over Alternative 1. Alternative 3 reinforces the careful management of cooperatives and selective participation based on need and is consistent with Policy Objective 4 to seek productive partnerships to help achieve policy objectives.

Alternative 3 adds a mitigation aspect to the active maintenance of department scientific expertise that is not recognized in Alternatives 1 and 2 through a commitment to keep abreast of and use the best available science. This is consistent with Policy Objective 5 to use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship. The ultimate validity and the ability of the department to defend its decisions depends in part on the capabilities of its scientists. Alternative 3 broadens the research mandate to include modern, integrated methods and technologies, consistent with modern adaptive management. Long-term impacts of ecosystem processes, such as biogeochemical cycling that cleans water and supports vegetation growth, and environmental condition, such as water quality or structures that provide wildlife habitat, will benefit from the more comprehensive approach on modern adaptive management (Lee, 1993).

Alternative 3 provides the most options to mitigate possible impacts to the environment by providing more relevant research to make informed management decisions for the resources managed by the department. If the information on which management decisions are based is taken out of context, managers could accept ineffective actions or reject effective measures. If decisions are based solely on observations, observer bias or limited experience could lead to the rejection of a valid management alternative or the continuation of invalid management alternatives that damage resources. For example, in some cases windthrow may look like devastation to a riparian management area from the roadside, when in fact some windthrow may add large woody debris. One needs to

consider broader ecological impacts and benefits before changing practices based on limited observation.

Alternative 3 recognizes the critical importance of the scientific staff maintained by the department and that outreach to other forest management organizations is an important part of the department's Research Program. It is recognized that much of the information, that will eventually support change in existing management procedures, can be developed by outside research and monitoring organizations. Maintaining the flow of information from external sources to department adaptive management is an essential research function under Alternative 3 that in turn can minimize, mitigate and avoid adverse impacts to the environment.

CUMULATIVE IMPACTS

The likelihood of probable significant adverse impacts will increase if research fails to provide critical information to advise management decision-making. Individual adaptive management changes resulting from newly acquired information usually go through SEPA review before implementation.

Alternative 1 could result in a greater risk of cumulative impacts because it does not explicitly recognize the complexity, risk and uncertainty that remain with some aspects of the *Habitat Conservation Plan's* conservation strategies.

Under Alternatives 1 and 2, probable significant cumulative impacts related to treatment and treatment frequency are related to the capacity of the site (soils, vegetation, climate) to recover before another impact. These site characteristics are unique for different ecoregions and sometimes sub-ecoregions. Alternative 3 reduces the likelihood of probable significant adverse impacts, compared to Alternatives 1 and 2, by recognizing that information on management impacts must be applied to the correct ecological context.

Alternative 3 further reduces the likelihood of probable significant adverse impacts from Alternatives 1 and 2 in recognizing the role of qualified analysis in designing, conducting and interpreting research. Having qualified scientific staff to review the SEPA analysis is important to reducing potential impacts.

Alternative 3 also reduces the risk of adverse cumulative impacts to the environment resulting from poorly advised management decisions. Alternative 3 ensures research priorities are focused on the areas of greatest uncertainty, research is conducted in the most appropriate location to have the greatest scope of inference and that staff is maintained to gather and interpret results.

3.4.8 External Relationships

INTRODUCTION

As the manager of 2.1 million acres of forested state trust land, the department is a neighbor to thousands of citizens, businesses and other forest landowners. The department values agency transparency and openness. Consequently, the department recognizes the importance of partnering with stakeholders and other governmental agencies, as well as providing information to the public to achieve trust objectives. The department is well-positioned to offer and promote environmental education, as forested state trust lands can serve as both a laboratory and an outdoor classroom.

The following Policy Objective applies to this policy subject area:

- Seek productive partnerships that help the department achieve policy objectives (Policy Objective 4).

AFFECTED ENVIRONMENT

The department currently practices active communication and promotes collaboration and partnering with other agencies, stakeholders and the public to achieve mutual objectives, where consistent with trust obligations.

REGULATORY FRAMEWORK

The regulatory framework with relation to this policy subject area is the State Environmental Policy Act (RCW 43.21C), which is described in the SEPA Review policy subject area in this Draft EIS. In addition, public review is provided for under the state Forest Practices Act, Chapter 76.09 RCW.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 directs solicitation of comments from stakeholders when preparing landscape-level objectives as part of a landscape planning process and as part of implementing and revising the policies in the *Forest Resource Plan*. Alternative 1 does not appear to meet Policy Objective 4 as well as Alternative 2.

POLICY STATEMENTS

***Forest Resource Plan* Policy No. 17, Soliciting Information: “The department will solicit comments from interested parties, including local neighborhoods, tribes and government agencies when preparing landscape-level objectives.”**

***Forest Resource Plan* Policy No. 35, Public Involvement: “The department will solicit comment from the public, tribes and government agencies when**

implementing the *Forest Resource Plan* and when revising policies contained in the document.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 reflects current department practices of active communication, promotion of collaboration and partnering with other agencies, stakeholders and the public. Alternative 2 recognizes the importance of establishing and maintaining positive external relationships for sharing information, obtaining input on department initiatives and planning and resolving issues. Alternative 2 best meets the applicable policy objective by utilizing partnerships with the Tribes, trust beneficiaries, government agencies and stakeholders to help implement Board of Natural Resources policy and department programs (Policy Objective 4).

POLICY STATEMENT

The department will actively communicate and promote collaboration and partnering with Tribes; trust beneficiaries; local, state and federal governments; stakeholders; and the public in carrying out department activities, including environmental education.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Although there are no environmental impacts associated with this policy subject area, it is important that the department has efficient and effective external relationships. This discussion is intended to set the context and disclose the merits in terms of the effectiveness of the policy alternatives.

Alternative 1 was adopted in order to correct the situation of dealing with conflicts and controversies on a case-by-case basis. At that time, it was a reactive approach and resulted in some inefficiencies and missed opportunities. Since 1992, the department has made outreach and communication a top priority when performing significant land management activities, both at the program and regional levels. Thus, a policy stating that the department will solicit comment from the public, Tribes and government agencies when implementing the *Forest Resource Plan* and when revising policies contained in the document does not acceptably convey the efforts the department has taken and will continue to take to fully communicate and engage the public, Tribes and stakeholders.

The department has made and will continue to make outreach and communication a top priority, particularly on efforts that are of public concern. For instance, the department recently engaged in an extensive outreach and communication effort for the Western Washington sustainable harvest calculation process, which exceeded the requirements of state law and rules.

Alternative 2 recognizes the need to establish and maintain external relationships, because it encourages the sharing of information and also provides opportunities to obtain resolution-based results. Strengthening the many relationships with various stakeholders

and the public is critical to the department's success as a trust manager and state agency. In addition, Alternative 2 reflects the department's current outreach and communication practices. It also reaffirms the importance and provides direction to all department employees to maintain this level of commitment, as it promotes agency transparency and openness.

CUMULATIVE IMPACTS

Cumulative impacts are indeterminable for these policy alternatives.

3.4.9 SEPA Review

INTRODUCTION

The State Environmental Policy Act (RCW 43.21C) requires state agencies to review actions that may have a probable, significant adverse impact on the environment. The department must comply with SEPA to ensure timely analysis and appropriate mitigation of environmental impacts during its various activities, including project planning and implementation.

AFFECTED ENVIRONMENT

The affected environment is any element of the environment, as listed in WAC 197-11-444, which may be affected by an agency proposal for action. For purposes of this policy subject area, the existing condition is a description of the department's current approach to complying with SEPA on actions pertaining to forested state trust lands. SEPA is one of the primary environmental review mechanisms through which mitigation of significant adverse impacts is considered.

Since the adoption of the *Forest Resource Plan*, advancements have been made in the review of management activities on forested state trust lands. Building on the Washington State Department of Ecology's standard SEPA environmental checklist, the department expanded the SEPA checklist to help the department disclose and understand landscape level interactions. The expanded SEPA checklist is currently used on all timber sales, except the few that are categorically exempt (WAC 197-11-830(7) and WAC 332-41-833). Adjacency and landscape/watershed administrative unit maps for the proposals are available on the internet at www.dnr.wa.gov under "SEPA Center." These maps promote understanding and analyses of landscape level considerations. The department expanded the Washington State Department of Ecology's environmental checklist to include approximately 100 additional considerations that describe overall watershed administrative unit conditions and potential future activities in the watershed.

REGULATORY FRAMEWORK

The following rules and statutes govern the department's SEPA review:

- Chapter 43.21C RCW, State Environmental Policy Act;
- WAC 197-11, State Environmental Policy Act Rules;
- WAC 332-41, Department of Natural Resources State Environmental Policy Act Procedures;
- Chapter 76.09 RCW, Forest Practices Act; and
- WAC 222, Forest Practices Rules.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 states that the department will comply with SEPA.

POLICY STATEMENT

Forest Resource Plan Policy No. 18, State Environmental Policy Act Review: “The department will conduct a State Environmental Policy Act review when subsequent plans and activities constitute a non-exempt agency action under the act.”

■ ALTERNATIVE 2 (DEPARTMENT’S RECOMMENDATION)

DISCUSSION

Alternative 2 recommends no policy in the *Policy for Sustainable Forests* related to SEPA Review, as the department must comply with state law.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Alternative 1 states that the department will comply with SEPA. However, compliance with SEPA is not optional. The analysis of adverse impacts and mitigation measures under this option is non-discretionary.

Alternative 2 recognizes that *Forest Resource Plan Policy No. 18* is not necessary, as the department must comply with state law.

CUMULATIVE IMPACTS

There are no probable significant adverse cumulative impacts as a result of these policy alternatives.

3.4.10 Implementation, Reporting and Modification

INTRODUCTION

The department has the responsibility to fully implement the *Policy for Sustainable Forests*. Ensuring Board of Natural Resources policies remain current requires ongoing monitoring and reporting on implementation. The information gathered through this process will allow review and update of Board of Natural Resources policies in response to changing circumstances. It will also keep the public informed on implementation of Board of Natural Resources policy. This process will include annual reporting on the implementation of the sustainable harvest policies adopted by the Board of Natural Resources in September 2004.

The following Policy Objective applies to this policy subject area:

- Monitor and periodically report to the Board of Natural Resources on the implementation and outcomes of Board of Natural Resources' approved policies (Policy Objective 10).

AFFECTED ENVIRONMENT

The department tracks the implementation of different policies through a variety of operational programs carried out in the department's six regions across the state. The programs (silviculture, timber sales, rights of way, etc.) monitor individual policy implementation and redirect program implementation as needed to achieve policy objectives and desired outcomes. Training is provided to assure understanding and ensure consistency in implementation.

The *Forest Resource Plan* assumed that some of the monitoring would be done at a landscape level, after the development of landscape plans. The department developed a system which updates the forest inventory and allows the department to determine if certain policies are being implemented.

The current focus of the department's monitoring efforts is on lands covered by the *Habitat Conservation Plan*. All timber and non-timber activities are tracked annually and reported to the Federal Services. In addition, several effectiveness and validation monitoring projects on the various *Habitat Conservation Plan* strategies are ongoing. The department has developed several electronic planning and tracking and geographical information systems to assist in monitoring.

The Board of Natural Resources' Resolution No. 1110 (2004) requires the department to report on an annual basis its assessment of the ecological and economic results of implementing the preferred alternative *Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington*. The department shall apply a structured monitoring and reporting program. Modification of Board of Natural Resources policies occurs as the need arises. For example, the sustainable harvest calculation resulted in the modification of five policies in the *Forest Resource Plan*.

REGULATORY FRAMEWORK

There are no regulations that apply to this policy subject area.

ALTERNATIVES

■ ALTERNATIVE 1 (NO ACTION)

DISCUSSION

Alternative 1 states that the department will attempt to meet the key elements of each policy, within budget constraints. Alternative 1 requires the department to monitor implementation of the *Forest Resource Plan* to ensure implementation and effectiveness of the policies. Alternative 1 commits the department to seek permission from the Board of Natural Resources to modify policies when necessary and appropriate, based on changes in law, scientific knowledge or public opinion. Alternative 1 directs the department to recommend any actions needed to the Board of Natural Resources to reconcile conflicting policy direction as a result of other management and policy plans. Alternative 1 does not appear to meet Policy Objective 10 as well as other alternatives.

POLICY STATEMENTS

Forest Resource Plan Policy No. 36, Implementing the Forest Resource Plan: “The department will attempt, within budget constraints, to meet the key elements in each of the policies described in this Plan.”

Forest Resource Plan Policy No. 37, Monitoring the Forest Resource Plan: “The department will monitor the Forest Resource Plan’s implementation to determine whether its policies are being executed efficiently and to measure the success of the plan in meeting its objectives.”

Forest Resource Plan Policy No. 38, Modifying the Forest Resource Plan: “The department will seek permission from the Board of Natural Resources to modify certain portions of the Forest Resource Plan if changes in law, scientific practice, major public attitudes or new management directions require a different course of action not compatible with the policies contained in the plan.”

Forest Resource Plan Policy No. 39, Consistency: “The department will review its other management and policy plans and will compare those with the Forest Resource Plan. Where policies overlap and where there is apparent conflict in direction, the department will determine precedence and suggest changes to the Board of Natural Resources for resolving these differences.”

■ ALTERNATIVE 2

DISCUSSION

Alternative 2 directs the department to employ a structured monitoring and annual reporting program to the Board of Natural Resources on the effectiveness and efficiency of the policies and their implementation. Alternative 2 directs the department to recommend changes to policy as needed due to changes in law, scientific knowledge or other circumstances. These changes could include changing budget and staffing resources that would affect implementation of policies. Alternative 2 assumes a ten-year life to the *Policy for Sustainable Forests*, with substantive review and update every ten years. Alternative 2 appears to meet Policy Objective 10 better than Alternative 1, but not as well as Alternative 3.

POLICY STATEMENTS

The department will employ a structured monitoring and annual reporting program to the Board of Natural Resources on implementation of the policies in the *Policy for Sustainable Forests*.

As needed, the department will recommend changes in policy to the Board of Natural Resources due to changes in law, scientific knowledge, new information or other circumstances.

At ten-year intervals, the department will perform a substantive review and update of the *Policy for Sustainable Forests*. Each review and update will be for a ten-year period.

■ ALTERNATIVE 3 (DEPARTMENT'S RECOMMENDATION)

DISCUSSION

Alternative 3 assumes periodic updates based on annual monitoring and reporting to keep the policies current, as well as substantive reviews at five-year intervals. Under Alternative 3, the *Policy for Sustainable Forests* is dynamic, with changes being recommended as needed and with no sunset or expiration date. Alternative 3 best meets the applicable policy objective by providing an adaptive management approach for review and update of Board of Natural Resources policy through monitoring and reporting on implementation of the *Policy for Sustainable Forests* (Policy Objective 10).

POLICY STATEMENTS

The department will employ a structured monitoring and annual reporting program to the Board of Natural Resources on implementation of the policies in the *Policy for Sustainable Forests*.

As needed, the department will recommend changes in policy to the Board of Natural Resources due to changes in law, scientific knowledge, new information or other circumstances.

At five-year intervals, the department will perform a substantive review of the *Policy for Sustainable Forests*. The *Policy for Sustainable Forests* will have no expiration date.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

This range of alternatives is purely procedural. They contain no standards controlling the use or modification of the environment. As such, there are no environmental impacts. This discussion is intended to provide the public and the Board of Natural Resources an analysis of the effectiveness of the range of alternatives in meeting the Board of Natural Resources' policy objectives.

Alternative 1 envisioned an organized system that would implement key elements of the policies, within budget constraints. However, it did not identify milestones to evaluate the level of implementation. It envisioned a monitoring system that would provide feedback information. The system was to be tied to landscape planning. It assumed that landscape plans would be developed, which would then form the geographic basis for monitoring the implementation of the policies. Currently, the department has created large database systems, such as the Forest Resource Inventory System and the Planning and Tracking system to help the department understand and analyze current forest conditions. The department has also begun to develop new geographic information system tools that allow users to understand and evaluate forest management activities. The *Forest Resource Plan* identified the purpose of landscape planning as "to develop a pragmatic working tool for the professional forester that will show at any given time the department's plans for a particular landscape." The department has created geographic information system tools, the Forest Resource Inventory System and the Planning and Tracking system, which have helped make more informed decisions.

The *Habitat Conservation Plan* has a built-in and very well-defined monitoring and adaptive management system that not only establishes a monitoring program, but also provides a mechanism for comprehensive reviews and updates. While this is a strategic plan for the department, it only covers 1.6 million acres of land and is tailored to meet the Federal Services' needs.

Alternative 1 calls for monitoring to track the level and success of implementation of department policies, but different programs are approaching implementation and monitoring from a programmatic perspective, rather than a department-wide perspective. The *Forest Resource Plan* recognized that over time, new information would become available or changes in law might necessitate policy change, allowing the department to react to the new information and/or public needs on a timely basis and to update the policies to reflect this. A consistent mechanism through which change would be evaluated and brought to the Board of Natural Resources has not been developed. Some of the plans, such as the *Habitat Conservation Plan*, have a built-in adaptive management process that evaluates new information and sets-up a mechanism for updates. Since the adoption of the *Forest Resource Plan*, many of the policies have been implemented as envisioned, with the department having the flexibility to conduct business in a prudent manner. However, tracking the level of success in implementation from a centralized and

comprehensive perspective and presenting this information on a periodic basis to the Board of Natural Resources has not occurred. While the programmatic approach may have been successful, it tends to retain information gained within the program and the knowledge gained is not necessarily shared across the department.

Alternative 2 would provide structured monitoring and annual reports to the Board of Natural Resources on policy implementation. It would provide a mechanism for updates due to changes in law, scientific practice, new information or other circumstances. The *Policy for Sustainable Forests* would undergo substantive review after ten years, when it expires. Alternative 2 differs from Alternative 1 by establishing a program that monitors the intensity and success of implementation of policies and reports these to the Board of Natural Resources on an annual basis. Presentation of this information on a periodic basis keeps the Board of Natural Resources informed on the levels of success and also on the need for different approaches. This would assure that the Board of Natural Resources remains current on the policy outcomes, how the policies are being implemented and be able to react to issues needing change or further direction.

A centralized monitoring system will also harmonize the requirements of the department's strategic plans to assist in meeting both the requirements of the Board of Natural Resources and the Federal Services for the *Habitat Conservation Plan*. This approach also assures the use of the knowledge gained elsewhere to increase efficiency and to make the information more widely available. It will provide a similar benchmark that will facilitate comparison between and within programs, thus assuring a consistent approach in implementation. The monitoring and reporting program would not be tied to completion of other plans, such as landscape plans, hence the program's performance would not be hampered by delay in completing other plans, due to budget or any other constraints.

Alternative 2 is an improvement over Alternative 1, as it directs the department to have a structured monitoring and reporting function. However, Alternative 2 will provide a ten-year timeframe before any substantive review is undertaken and the *Policy for Sustainable Forests* would expire after ten years. A ten-year review process is onerous and requires substantial financial and staffing resources. Since Alternative 2 calls for changes only when needed, a risk exists for operating under policies that are not completely up-to-date. In this regard, Alternative 2 does not differ from Alternative 1.

Alternative 3 is similar to Alternative 2, but it sets the substantive review at five-year intervals and has no expiration date. The substantive review after five years will allow updates to policies, ensure that the policy language is current and relevant and will provide the public with opportunities in the review and update process. Since the Board of Natural Resources will be continuously engaged during the annual reporting process, it will be able to provide more specific and timely direction on areas requiring a more in-depth review. With this more frequent timeline, the changes needed may not require such a significant amount of financial and staffing resources. The existing centralized monitoring and reporting program for the *Habitat Conservation Plan* will be used as a foundation for this review. The timely reviews will keep the policies current.

CUMULATIVE IMPACTS

Implementation, reporting and modification assures that department policies within the framework of the *Policy for Sustainable Forests* are being implemented effectively and consistently. It also assures that there is a mechanism to inform the Board of Natural Resources about success of policy implementation and an adaptive management loop to respond to a changing environment. The cumulative impacts of implementing the individual policies in the *Policy for Sustainable Forests* have been considered under each of the different policy subject areas in this Draft EIS. There are no foreseen cumulative impacts to the environment that would result from the process of tracking implementation, reporting and modification of the adopted policies in the *Policy for Sustainable Forests*.



Appendix A.

Sustainable Harvest Calculation Policies

These policies were adopted by the Board of Natural Resources on September 8, 2004, when making the sustainable harvest calculation decisions.

POLICY MANUAL

Department of Natural Resources

Date: September 8, 2004

Page: 1 of 2

**PO14-B CIRCUMSTANCES TRIGGERING THE NEED FOR A
RECALCULATION OF THE SUSTAINABLE HARVEST
CALCULATION**

DISCUSSION

State law requires that the Department shall manage the state-owned lands under its jurisdiction, which are primarily valuable for the purpose of growing forest crops on a sustained yield basis. “To this end, the Department shall periodically adjust the acreages designated for inclusion in the sustained yield management program and calculate a sustainable harvest level.” (RCW 79.10.320) State law also defines sustainable harvest level as, “Sustainable harvest level means the volume of timber scheduled for sale from state-owned lands during a planning decade as calculated by the department and approved by the board.” (RCW 79.10.300(5))

The legislature envisioned that the sustainable harvest level is likely to need adjustment from time to time, based on the quantity, quality, growth, and availability of the timber resource on state lands. At the time the statute was enacted, the suitable time period was thought to be one decade, with the average annual sustainable harvest level remaining constant during the decade.

Currently, the factors affecting a stable long-term sustainable harvest calculation remain dynamic. Regulatory requirements are in flux, and information about the resource base continues to improve. In addition, new more powerful and flexible computer models have emerged, making it feasible to adjust the harvest level as circumstance changes. At the same time, the fundamental trust obligations and statutory requirements continue to be the foundation of policy.

POLICY

The department, with board approval, will recalculate the statewide sustainable harvest level, for board adoption no less frequently than every ten years.

The department will adjust the calculation and recommend adoption by the board when the department determines changing circumstances within the planning decade suggest that an adjusted harvest level would be prudent. Such circumstances may include major changes in legal requirements, significant new policy direction from the board, new information about the resource base available for harvest, or changes in technology.

Approved: September 8, 2004

Approved By: /S/
Doug Sutherland
Commissioner of Public Lands

SEE ALSO

RCW 79.10.300 Land Management Authorities and Policies – Definitions

RCW 77.10.320 Land Management Authorities and Policies – Sustainable Harvest Program

Date: September 8, 2004

Page: 1 of 2

**Cancels: PO14-004 Sustainable Even-Flow Timber Harvest, Dated: July 1992
PO14-005 Harvest Levels Based on Volume, Dated: July 1992
PO14-006 Western Washington Ownership Groups, Dated: July 1992**

PO14-B DEFINITION OF SUSTAINABILITY FOR THE SUSTAINABLE HARVEST CALCULATION

DISCUSSION

State law requires that the Department shall manage the state-owned lands under its jurisdiction, which are primarily valuable for the purpose of growing forest crops on a sustained yield basis. "To this end, the Department shall periodically adjust the acreages designated for inclusion in the sustained yield management program and calculate a sustainable harvest level." (RCW 79.10.320) State law also defines sustainable harvest level as, "Sustainable harvest level means the volume of timber scheduled for sale from state-owned lands during a planning decade as calculated by the department and approved by the board."(RCW 79.10.300(5))

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Approved: September 8, 2004

Approved By: /S/
Doug Sutherland
Commissioner of Public Lands

SEE ALSO

RCW 79.10.300 Land Management Authorities and Policies – Definitions

RCW 77.10.320 Land Management Authorities and Policies – Sustainable Harvest Program

Appendix B. Ecoregions of the State



The department manages 2.1 million acres of forested state trust lands; 1.4 million acres in Western Washington and .7 million acres in Eastern Washington. As the above map reflects, there are nine ecoregions that make up Washington State: Northwest Coast; Puget Trough; North Cascades; West Cascades; East Cascades; Okanogan; Canadian Rocky Mountains; Blue Mountains; and Columbia Plateau. Each of these ecoregions are further described in this appendix.

Washington Ecoregion	DNR Surface Ownership	DNR Forested Acres
Blue Mountains	20,140	4,852
Canadian Rocky Mountains	104,992	98,068
Columbia Plateau	595,111	18,117
East Cascades	293,959	227,110
North Cascades	346,494	321,104
Northwest Coast	641,554	625,435
Okanogan	442,191	327,698
Puget Trough	213,342	201,987
West Cascades	333,198	321,018
TOTAL	2,990,981	2,145,389

DISTURBANCES

Major disturbance events, both natural and human-caused, have defined the current condition of Western Washington forested state trust lands. Windstorms, which create chaotic patterns of broken and windthrown trees, have shaped Washington forests through the centuries. Examples of notable historic windstorms are the 1921 storm on the western Olympic Peninsula and the Columbus Day storm of 1962, which blew down thousands of acres of mature timber in Western Washington. Major ice storms, such as the 1955 freeze, have also changed the structure of forests all over Western Washington. Today, numerous forest stands containing trees with crooked boles and forked tops serve as reminders of the millions of treetops killed by this freeze. Fire, both natural and human-caused, has historically been one of the great shapers of forest composition in both Eastern and Western Washington. As an example, parts of the 94,055-acre Yacolt Burn State Forest in southwestern Washington burned several times between 1902 and 1952. Today, this area is forested with young Douglas-fir trees and a few old remnant trees in riparian areas and ravines.

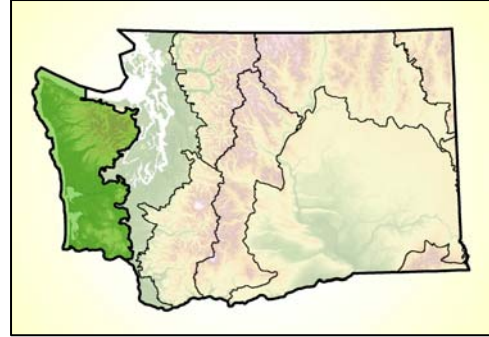
While a century of fire control has played a key role in creating the current forestland conditions in Western Washington, timber harvest is probably the greatest human influence. Almost all forested state trust lands have been logged at least once in the last 100 years. Much land in Western Washington was clearcut and logged from 1900 to 1940. Some of the harvested land was abandoned and then acquired later by the state as State Forest Transfer Lands or State Forest Purchase Lands. Remnants of logging railroads and abandoned truck roads are scattered on state lands and bear witness to the intensity of logging in Western Washington in the first half of the 20th century and earlier. Fire scars on residual trees and charred old-forest stumps show the effects of frequent fires that followed the first logging in those early years. Large parts of these forests naturally reseeded themselves from trees that survived the fires and from the hardwoods and other species in unburned riparian areas. After the fires, alder flourished in some landscapes that were once dominated by old conifers. The presence of large conifer stumps in many alder stands shows this vegetation change.

Historically, stand-replacement fires occurred at irregular intervals from ten years in the lowlands to 150 years or more at high elevations. The control of forest fire this century has played a key role in defining the existing conditions. Fire has been minimized in many areas that formerly burned naturally at fairly regular intervals. In many places, this has significantly changed the species in and around structural composition of forests. For example, frequent low-intensity fires once maintained large areas of ponderosa pine. The thick bark of the pine protected it from significant damage while less fire-tolerant trees were killed. By nearly eliminating fire from these areas, species such as grand fir developed dense understories that have excluded pine regeneration. These new stands are more structurally diverse, but their multi-layered canopies are more susceptible to catastrophic fires. These dense stands of relatively low value timber are also susceptible to insects and disease.

NORTHWEST COAST ECOREGION

The Northwest Coast ecoregion includes most of the Olympic Peninsula of Washington, the coast mountain ranges extending down to central Oregon, and most of Vancouver Island in British Columbia. Approximately 11 percent of Washington is within this ecoregion.

Approximately 5 percent of the ecoregion is agriculture and urban environments with most cities located near Grays Harbor and Willapa Bay. There are 641,554 acres of department-



managed lands within the Northwest Coast Ecoregion, of which 625,435 are forested.

PHYSIOGRAPHY

The Olympic Mountains, the ocean coast and coastal plain, and the Willapa Hills are the ecoregion's dominant landforms. Glaciated peaks in the Olympic Mountains rise to an elevation of nearly 8,000 feet above sea level. Streams and rivers typically begin as deeply incised, steep-gradient drainages that eventually feed large, low-gradient river systems on the coastal plain. The coastal plain is up to 20 miles wide on the Olympic Peninsula and mostly underlain by glacial till and outwash. Major estuaries and associated dunes are found on the southern coast. The Willapa Hills are well-rounded highlands with old, well-weathered soils.

CLIMATE

High precipitation typifies the ecoregion, averaging 60 to 240 inches annually. Most precipitation falls as rain from November through April. Snow pack and rain-on-snow zones cover a considerable area only in the Olympic Mountains. As a result of a rain shadow effect, the northeastern side of the Olympic Mountains receives the lowest precipitation of equivalent elevations anywhere in Western Washington. Along the outer coast and adjacent valleys, fog and cool temperatures in the summer are important climatic factors.

BIOTA

Coniferous forests dominate the vegetation of the ecoregion. Typical lowland forests are dominated by western hemlock, Douglas-fir and western red cedar. In the coastal fog belt, Douglas-fir is rare and Sitka spruce becomes abundant. Forests in the mountains are mostly dominated by Pacific silver fir and mountain or western hemlock. High elevations in the Olympic Mountains have sub-alpine parkland and alpine habitats.

Two of the largest estuaries on North America's west coast are part of this ecoregion. Other special habitats include coastal dunes, wetlands, riparian areas and sphagnum bogs. The Olympic Mountains are rich in rare plant species due to their isolation, the number of unusual habitats and the presence of steep environmental gradients. They include both those endemic to the Olympic Mountains and those disjunct from other mountainous areas.

Amphibian diversity is relatively high within this ecoregion. Vascular plant endemism is high, particularly in the northeast corner of the ecoregion.

Since the 1960s, the department has used a sustainable harvest approach in managing forested state trust lands. Designated areas are harvested and regenerated each year. Most early regeneration efforts concentrated on establishing Douglas-fir in recently harvested or deforested areas. Today, a mix of harvest practices and a variety of tree species are typically prescribed to match site-specific management prescriptions with the environmental characteristics of a site.

PUGET TROUGH ECOREGION

The Puget Trough ecoregion is nestled between the Cascade and Olympic Mountains and the Willapa Hills. It includes Puget Sound and the lowlands south to the Columbia River. The ecoregion extends north into the Georgia Basin in British Columbia and south into the Willamette Valley in Oregon. Roughly 8 percent of Washington is within this ecoregion. The state's most densely populated ecoregion with over 50 percent of its area supporting urban environments and agriculture. There are 213,342 acres of department-managed lands within the Puget Trough ecoregion, of which 201,987 are forested.



PHYSIOGRAPHY

The Puget Trough ecoregion includes the marine waters of Puget Sound and the lowlands generally up to about 1,000 feet above sea level. A few isolated highlands within the ecoregion extend up to 2,400 feet in elevation. Pleistocene glaciers left glacial till plains over much of the area north of Olympia and outwash plains between Tacoma and Centralia. Ancient, well-weathered soils predominate between Centralia and Clark County. Pleistocene flood events formed the smooth floor of the Portland Basin in the vicinity of Vancouver. In the far north, the San Juan Islands and mainland hills are composed of rocks common in the adjacent mountainous ecoregions. Large, low-gradient rivers typically begin in the adjacent mountains and flow through this ecoregion. Many small streams originate at low elevations. Freshwater lakes are numerous in the glaciated portions of the ecoregion.

CLIMATE

Much of the Washington portion of the ecoregion is influenced by the rain shadow effect of the Olympic Mountains and Willapa Hills. Precipitation, primarily rain, averages 20 to 70 inches per year. Summers are warm and dry compared to elsewhere in Western Washington and winters are relatively mild.

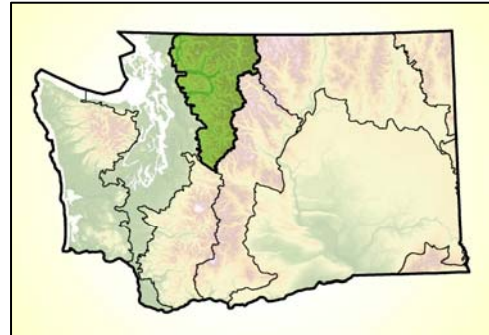
BIOTA

The vegetation of the Puget Trough is dominated by Douglas-fir forests with western hemlock and red cedar as the primary late-successional species. Oregon white oak,

Pacific madrone, big leaf maple, and red alder forests are frequent components of the landscape. Grassland habitats are often associated with oak habitats and support a number of rare species, including the federally threatened golden paintbrush and a number of butterfly species. Historically, frequent fires maintained these grasslands and the adjacent open oak woodlands. Many rare grassland species are declining as this landscape becomes more urbanized and fire suppression leads to more densely forested areas. Other special habitats within the ecoregion include wetlands, riparian areas, bogs and estuaries.

NORTH CASCADES ECOREGION

The North Cascades ecoregion includes the Cascade Mountains north of Snoqualmie Pass and west of the crest extending northward into British Columbia. Approximately 10 percent of Washington occurs within this ecoregion. Less than 2 percent of the ecoregion is agriculture and urban environments concentrated in lowland valleys near the Puget Trough. There are 346,494 acres of department-managed lands within the North Cascades ecoregion, of which 321,104 are forested.



PHYSIOGRAPHY

The North Cascades is composed of highly dissected, glaciated mountain terrain, mostly between 1,000 and 7,000 feet above sea level. The highest peaks are volcanoes that rise to over 10,000 feet. Valley bottoms extend down to as low as 500 feet. Glacially carved U-shaped valleys and cirques are prominent features. Watersheds typically begin as steep-gradient small stream drainages that feed major rivers leading into the adjacent Puget Trough ecoregion. Natural lakes, most of which were created by glacial processes, are plentiful.

CLIMATE

High precipitation typifies the ecoregion, varying from around 60 to 160" per year. Most precipitation accumulates from October through April as snow and rain. High elevations in the mountains are covered with snow for many months. Middle elevations have significant snow packs that fluctuate over the course of the winter with rain-on-snow events. Lower elevations within the ecoregion accumulate little snow or have transient snow packs.

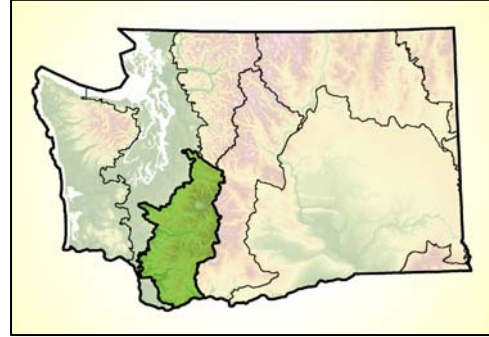
BIOTA

The vegetation of the North Cascades ecoregion in Washington consists mostly of western hemlock-Douglas-fir-western red cedar forests at low elevations, Pacific silver fir-western hemlock forests at middle elevations, and a mosaic of mountain hemlock-silver fir forests and sub-alpine parkland at high elevations. Natural stand-replacement fires occur at irregular intervals of 90 to 250 years. Above the timberline, alpine heaths, meadows and fellfields are interspersed with barren rock, ice and snow. Special habitats include riparian areas dominated by broadleaf trees, avalanche chutes dominated by Sitka

alder or vine maple and wetlands. Rare plant species in this ecoregion are often circumboreal species on the southern edge of their range, with populations scattered in the high Cascades. This ecoregion is one of the few in Washington with a variety of large carnivores, including gray wolf, grizzly bear and wolverine. Salmon are found in most of the large rivers.

WEST CASCADES ECOREGION

The West Cascades ecoregion extends west from the Cascade crest from Snoqualmie Pass southward to the Oregon-California border. Approximately 8 percent of Washington is within this ecoregion. Around 8 percent of the ecoregion is agriculture and urban environments located in lowland valleys near the Puget Trough and the Columbia River Gorge. There are 333,197 acres of department-managed lands within the West Cascades Ecoregion, of which 321,018 are forested.



PHYSIOGRAPHY

The West Cascades ecoregion consists mostly of highlands modified by montane glaciers and associated riverine valleys. The typical elevation range is 1,000 to 7,000 feet above sea level, with the highest peaks rising to over 14,000 feet on Mount Rainier and the lowest elevations in the Columbia River Gorge at 50 feet. Isolated volcanic peaks and associated high plateaus rise above surrounding steep mountain ridges. These mountains were formed primarily from extrusive volcanic rocks. Small, steep-gradient streams typically feed major rivers. Natural lakes are frequent and typically were created by glacial processes and landslides.

CLIMATE

The climate of this ecoregion is wet and relatively mild. Average annual precipitation ranges from about 55 to 140 inches. Most precipitation accumulates from October through April as snow and rain. High elevations in the mountains are continuously covered with snow for months. Middle elevations have significant snow pack that fluctuates over the course of the winter with rain-on-snow events. The lowest elevations accumulate little snow and generally have a transient snow pack.

BIOTA

Conifer forests dominate the vegetation of the West Cascades ecoregion. Douglas-fir-western hemlock forests are typical at low elevations. Middle elevations characteristically have Pacific silver fir, western hemlock, Douglas-fir and noble fir. High elevations have mountain hemlock-silver fir forests and sub-alpine parklands. Higher elevations on volcanic peaks support alpine heath, meadows, and fellfields among glaciers and rock. Special habitats include riparian areas dominated by broadleaf species, wetlands, grassy balds and oak woodlands. Mount Rainier supports a few endemic rare plant species, as does the Columbia River Gorge. Both are areas of high plant diversity. The Columbia

River Gorge has added biogeographic significance because of the mixing of coastal and interior floras.

EAST CASCADES ECOREGION

The East Cascades ecoregion lies east of the Pacific Crest, from Sawtooth Ridge near Lake Chelan south to the Oregon-California border. Its eastern border follows the montane forest-lowland shrub-steppe transition.

Approximately 10 percent of Washington is included within this ecoregion. Around 10 percent of the ecoregion is agriculture and urban environments located in lowland valleys along major transportation corridors and the

Columbia River Gorge. There are 293,959 acres of department-managed land within the East Cascades ecoregion, 227,110 of which are forested.



PHYSIOGRAPHY

The Eastern Cascades of Washington were modified by alpine glaciers and landslides which created rugged ridges extending southeast to east from the Cascade crest. Broad valleys occupy the lowlands between the mountain ridges. Isolated volcanic cones appear on the steep mountain ridges, but do not rise to the heights of volcanoes in the Western Cascades. A varied geology occurs in the east Cascades, including large serpentine areas in the Wenatchee Mountains. The typical elevation range is between 2,000 and 7,000 feet with the highest peak, Mt. Adams (12,276 feet) on the Pacific Crest and the lowest elevation in the Columbia River Gorge (100 feet). The Eastern Cascade ecoregion extends eastward to include the Wenatchee and Simcoe mountains.

CLIMATE

The climatic changes rapidly west to east, from cold with high precipitation (120 inches) along the Cascade crest to hot and dry with less than 20 inches per year along the foothills. Most precipitation accumulates from November through April. A snow pack develops at higher elevations.

BIOTA

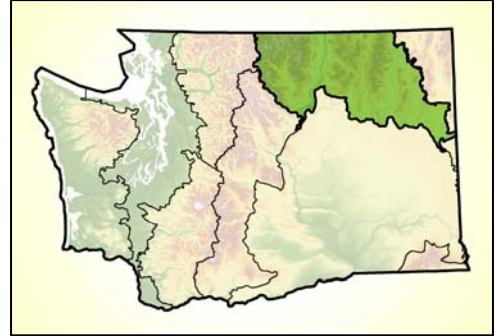
Conifer forests dominate the East Cascades ecoregion, although they are usually more open and patchy than forests of ecoregions west of the Cascade crest. Grand fir-Douglas-fir-Ponderosa pine forests are characteristic types. Oregon white oak woodlands appear at lower elevations and sub-alpine fir-mountain hemlock-Engelmann spruce types are typical at higher elevations. Douglas-fir-western hemlock-Pacific silver fir forests are present and locally can be abundant near low divides of the Cascades. Whitebark pine, lodgepole pine and western larch are common components of these forests.

Shrub-steppe vegetation occurs along the foothills and higher south-facing slopes and is often represented by big sagebrush or antelope bitterbrush with native bunchgrasses.

Alpine and sub-alpine parklands occur on the highest ridges and, more commonly, north of Snoqualmie Pass.

OKANOGAN ECOREGION

The Washington portion of the Okanogan ecoregion extends from the Cascade crest in the North Cascades east to the Selkirk Mountains. The ecoregion extends up the east slope of the Cascades into Canada and along the west slope of the Canadian Rockies to Kamloops, British Columbia. The southwestern border of the ecoregion follows Sawtooth Ridge northeast of Lake Chelan. The Methow and Okanogan valleys are included, as are the Okanogan Highlands east to the Colville and Spokane valleys. Approximately 14 percent of Washington is within this ecoregion. Around 15 percent of the ecoregion is agriculture and urban environments located in the Spokane, Colville and Okanogan valleys. There are 213,342 acres of department-managed lands within the Okanogan Ecoregion, 327,698 of which are forested.



PHYSIOGRAPHY

The Okanogan ecoregion is less distinct in terms of major landforms than other Washington ecoregions. It is more transitional, much of it having characteristics of adjacent areas. The northeast Cascades are the highest and most rugged part of the ecoregion, with peaks rising to over 9,400 feet.

The high mountains give way to a series of valleys with the lowest elevations around 750 feet. To the east, the mountains are more rounded. The Kettle Range and Huckleberry Mountains are prominent features. Continental and alpine glaciers played a major role in shaping the landforms of this ecoregion.

CLIMATE

Overall, this ecoregion has the coldest climate in the state. The western part of the ecoregion is in the rain shadow of the Cascade Mountains, while the eastern part is in a zone of increasing precipitation created by the Rocky Mountains. The ecoregion is influenced by the extremes of hot, dry air from the Columbia Basin in the summer and cold, dense arctic air in the winter. Annual precipitation is variable, from less than 12 inches in the Okanogan Valley to 50 to 90 inches in the Cascades. Most of the ecoregion falls within a 14 to 24 inches zone. There are fairly steep temperature and precipitation gradients from the mountains to the valleys within this ecoregion.

BIOTA

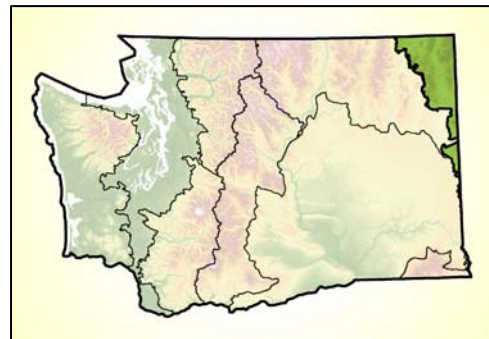
Conifer forests dominate the mountain ridges and low hills in the ecoregion, while valleys and lowlands are often non-forested. The conifer forests are more open and less continuous, consisting of smaller stands, than forests west of the Cascade crest and in the Canadian Rockies. Douglas-fir-ponderosa pine form the ecoregion's characteristic

forests. They transition to shrub-steppe in the low broad valleys in the eastern part of the ecoregion, and to grasslands in the western part. Sub-alpine fir-Engelmann spruce forests occur at higher elevations. Whitebark pine, lodgepole pine and sub-alpine larch form parklands in the highest elevations, often associated with dry alpine or sub-alpine meadows. The moister forests are dominated by Douglas-fir, with western larch, western white pine or quaking aspen as common components.

This ecoregion has a relatively high number of plant species that are rare in Washington, but more common to the north. This is particularly the case near Chopaka Mountain and in the Kettle Range. A few animal species from this ecoregion are also of particular conservation concern, including lynx, bull trout and grizzly bear.

CANADIAN ROCKY MOUNTAINS ECOREGION

The Canadian Rocky Mountains ecoregion is located in the northeastern corner of Washington. The vast majority of this ecoregion occurs in adjacent British Columbia and Idaho, extending into Alberta and Montana. Approximately 4 percent of Washington is within this ecoregion. No more than 10 percent of the ecoregion is agriculture and urban environments located in major lowland valleys. There are 104,992 acres of department-managed lands within the Canadian Rocky Mountains ecoregion, of which 98,068 are forested.



PHYSIOGRAPHY

The Selkirk Mountains and the north-flowing Pend Oreille River are the dominant landforms of this ecoregion in Washington. The Selkirk Mountains are transitional between the rolling Okanogan Highlands to the west and the higher ridges and mountains interspersed with wide valleys to the east. The Washington portion of the ecoregion was completely glaciated and now displays ice-carved, U-shaped valleys and isolated ice-sculpted mountain peaks. Elevations range from 1,300 feet along the Columbia River to greater than 7,000 feet in the Salmo-Priest Wilderness Area.

CLIMATE

Annual precipitation ranges from less than 18 inches along the Columbia River south of Northport to around 80 inches in the Salmo-Priest Wilderness Area. Most of the ecoregion falls within a 24 to 34 inches precipitation zone. Significant snow pack develops at mid and upper elevations.

BIOTA

Coniferous forests dominate this ecoregion. The composition of the forests reflects variation in moisture, temperature and elevation. Douglas-fir-ponderosa pine forests occur at low elevations; grand fir-western hemlock-western red cedar forests are characteristic of mid-montane elevations; and sub-alpine fir-Engelmann spruce forests

are found at higher elevations. Whitebark pine, lodgepole pine, and sub-alpine larch form parklands in the highest elevations. Western larch and western white pine can be major components of the moister forests.

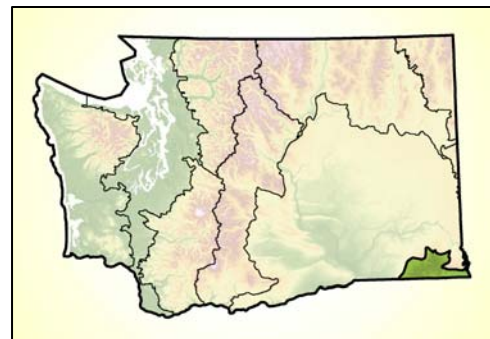
Fire has played a significant role in the development of the forests in this ecoregion, with a 10-year return interval in the lowland foothills and a 150-year return interval at high elevations and in protected canyons. The control of forest fire this century has played a key role in defining the existing conditions. Fire has been minimized in many areas that formerly burned naturally at fairly regular intervals. In many places this has significantly changed the species in and around structural composition of forests. For example, frequent low-intensity fires once maintained large areas of ponderosa pine. The thick bark of the pine protected it from significant damage while less fire-tolerant trees were killed. By nearly eliminating fire from these areas, species such as grand fir developed dense understories that have excluded pine regeneration. These new stands are more structurally diverse, but their multi-layered canopies are more susceptible to catastrophic fires. These dense stands of relatively low value timber are also susceptible to insects and disease.

Grasslands occur along the foothills and on higher elevation, south-facing slopes. These grasslands are variously dominated by green fescue, Idaho fescue or rough fescue.

The ecoregion has a number of plant species that are rare in Washington, but more common in the Rocky Mountains. The ecoregion, including the Washington portion, is home to moose, mountain caribou and grizzly bear.

BLUE MOUNTAINS ECOREGION

The Blue Mountains - Middle Rockies ecoregion extends from adjacent Idaho and Oregon into the southeast corner of Washington. It includes the Grande Ronde and Snake River canyons northward to a few miles south of Clarkston. Approximately 1 percent of Washington is within this ecoregion. Less than 1 percent of the ecoregion is agriculture and urban environments with no incorporated city limits in its Washington boundary. There are 20,140 acres of department-managed lands within the Blue Mountains ecoregion, of which 4,852 are forested.



PHYSIOGRAPHY

Columbia River Basalt flows were uplifted to form the Blue Mountains, which were simultaneously down-cut by the Grande Ronde and Snake Rivers. Today, flat top plateaus above deep canyons are characteristic of Washington's Blue Mountains. The typical elevation range is between 2,000 and 4,000 feet, with the highest peak at 6,387 feet and the lowest elevation at 750 feet along the Snake River. Windblown silts and volcanic ash cover most of the plateaus, providing material for soil development.

CLIMATE

Annual precipitation ranges from less than 10 inches in the canyon of the Grande Ronde River to more than 50 inches twenty-five miles to the west in the Wenaha-Tucannon Wilderness Area. Most of the ecoregion is within a 14 to 24 inches precipitation zone. Much of the precipitation appears as snow, although fall and spring rains are common, often creating flood events.

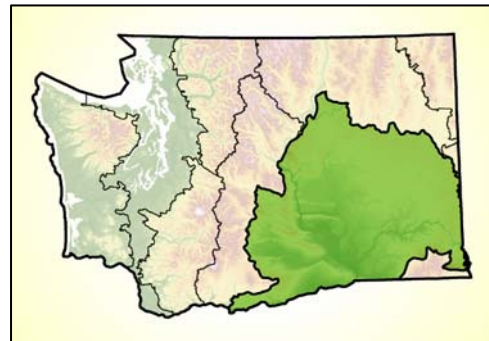
BIOTA

The Blue Mountains ecoregion is dominated by coniferous forest, but because of its characteristic abrupt topography and wide elevation ranges, it also supports grasslands and shrublands along low dry canyons, on broad plateaus and in sub-alpine meadows. Douglas-fir-ponderosa pine forests are characteristic of the low and middle elevations, with sub-alpine fir-Engelmann spruce types occurring at higher elevations. Western larch, lodgepole pine, and western white pine are components of mesic forests. Canyon grassland vegetation occurs on the steep slopes above the Grande Ronde and Snake Rivers. Plateau grasslands appear within the forest matrix. Dense shrublands occur in the higher canyons along the Oregon border.

Historically, stand-replacement fires occurred at irregular intervals from ten years in the lowland foothills to 150 years or more at high elevations. The control of forest fire this century has played a key role in defining the existing conditions. Fire has been minimized in many areas that formerly burned naturally at fairly regular intervals. In many places this has significantly changed the species in and around structural composition of forests. For example, frequent low-intensity fires once maintained large areas of ponderosa pine. The thick bark of the pine protected it from significant damage while less fire-tolerant trees were killed. By nearly eliminating fire from these areas, species such as grand fir developed dense understories that have excluded pine regeneration. These new stands are more structurally diverse, but their multi-layered canopies are more susceptible to catastrophic fires. These dense stands of relatively low value timber are also susceptible to insects and disease.

COLUMBIA PLATEAU ECOREGION

The Columbia Plateau ecoregion includes the area in Eastern Washington bounded by the Cascade, Okanogan, Blue and Rocky Mountains. It extends south in eastern Oregon to the Nevada border and then east to the Snake River Plain in Idaho. Approximately one-third of Washington is in this ecoregion. Over 50 percent of the ecoregion is primarily agriculture with scattered urban environments. There are 595,111 acres of department-managed lands within the Columbia Plateau ecoregion, of which 18,117 are forested.



PHYSIOGRAPHY

The primary, nearly exclusive, bedrock of this ecoregion is Columbia River basalt. Windblown silts and volcanic ash cover extensive areas, having created rolling, deep, productive soils. Ice-age floods carved deep canyons and coulees through the basalt. The floods also scoured some areas of soils and vegetation, leaving the basalt exposed on the surface. The ecoregion's dominant landforms include the Palouse Hills, the Channeled Scablands, the Yakima Fold Hills and the Pasco Basin. Elevations range from 160 feet above sea level along the Columbia River in the southwestern corner to nearly 4,000 feet above sea level on isolated hills (Badger and Tekoa mountains).

CLIMATE

This is the hottest and driest ecoregion in the state. It lies in the rain shadow of the Cascade Mountains. Annual precipitation generally increases west to east from around 6 inches per year along the Hanford Reach of the Columbia River to 25 inches in the Palouse Hills. Most of the ecoregion receives 8 to 14 inches of precipitation. The control of forest fire this century has played a key role in defining the existing conditions. Fire has been minimized in many areas that formerly burned naturally at fairly regular intervals. In many places this has significantly changed the species in and around structural composition of forests. For example, frequent low-intensity fires once maintained large areas of ponderosa pine. The thick bark of the pine protected it from significant damage while less fire-tolerant trees were killed. By nearly eliminating fire from these areas, species such as grand fir developed dense understories that have excluded pine regeneration. These new stands are more structurally diverse, but their multi-layered canopies are more susceptible to catastrophic fires. These dense stands of relatively low value timber are also susceptible to insects and disease.

BIOTA

The ecoregion is most often characterized as shrub-steppe dominated by various species of sagebrush and bunchgrasses. Most of the ecoregion's remaining native vegetation occurs on steep canyon sides and on the shallower soils of basalt scablands. Bitterbrush and three-tip sagebrush steppe appear along the foothills of the Cascades. Douglas-fir-ponderosa pine forests occur on the moister sites near the foothills of the surrounding mountains. Special habitats include sand dunes, gravelly areas, basalt cliffs, steep canyons, alkali lakes and vernal pools.

Many grassland and shrub-steppe species in this ecoregion are declining. Isolation and fragmentation of intact habitat is a primary factor. Non-native, weedy plant species are also a factor; they are a persistent and increasing feature of the limited semi-natural and natural landscape.



Appendix C.

Commissioner's Order on Tribal Relations

COMMISSIONER'S ORDER

Inherent tribal sovereignty and tribal rights predate the formation of the United States and the State of Washington. Treaties signed during the 1850's by the tribes of the Washington Territory reserved, among other rights and considerations, the right "to fish at all usual and accustomed places, and gather roots and berries and hunt on open and unclaimed land," in exchange for ceding millions of acres of land.

Today, part of those ceded lands are the 5.6 million acres of federally granted trust lands and submerged lands, which the Washington State Department of Natural Resources carefully manages for all the citizens of the state. Similar to the tribal tradition of considering seven generations into the future when making important decisions, the Department of Natural Resources has a moral and legal obligation to the current and future generations of beneficiaries of the state trust lands and submerged lands managed by the Department.

Added to the land management responsibility, the Department bears public obligations in carrying out its regulatory, and fire control programs. The Department also shares with the tribes the objectives of proper stewardship of public resources and acknowledges and respects the values, culture, and natural resources wisdom accumulated by tribal people over the millennia.

In 1989, the Governor of the State of Washington and twenty-four tribes around the state signed the Centennial Accord in order to promote better relationships through a commitment to communication and problem solving. In the spirit, recognition, and support of the goals of the Centennial Accord and its supplementary document the 2000 Millennium Agreement, the Department hereby reaffirms its commitment to collaborative tribal relationships.

The Department of Natural Resources recognizes the sovereign status accorded the twenty-nine Federally Recognized Tribes in the State of Washington. Collaboration with tribal governments is emphasized through cooperative management opportunities as well as consultation on significant natural resource related issues that affect tribes; for example, the Department's regions and divisions will consult with tribes whenever appropriate for operational and program planning.

DEPARTMENT COMMITMENTS

1.) Collaborative Problem Solving

Consistent with this government-to-government policy, the Department recognizes it is in the best interest of all parties to resolve issues and concerns outside of the courts whenever possible. Cooperation between the Department and tribal governments is to be emphasized. The Department in good faith will exhaust all reasonable means of discussions, negotiation, and mediation before pursuing judicial resolution. In these discussions and negotiations, the Department will seek outcomes mutually beneficial to the tribes and the state.

2.) Issue Resolution

It is the Department's policy to resolve mutual issues and concerns with the tribes at the lowest organizational level of governmental authority. Technical personnel should resolve technical issues and refer policy disagreements to appropriate representatives within the governmental structure. The appropriate Region Manager will represent the first level of policy for the Department. The Commissioner of Public Lands and the respective tribal council will determine ultimate decisions of policy.

3.) Periodic Meetings

The Department will meet periodically with all Eastside and Westside tribes. The Department will provide information on its programs and organization to the tribes and invites the tribes to submit information about tribal programs to facilitate issue awareness and improve governmental relations.

4.) Continued Commitment

To ensure a consistent and positive relationship with each Federally Recognized Tribe of Washington, the Department will continue to support and fund its Tribal Relations Program as an important ongoing element in its commitment to respect the sovereign status of tribal governments.

/S/

Doug Sutherland
Commissioner of Public Lands



Appendix D.

Prehistory of Cultural Resources

PREHISTORY

Prehistory is usually divided into three parts: Paleo Indian Period, Developmental Period, and Ethnographic Period.

Paleo Indian Period (Initial Occupation – 7,500 Years Ago)

The first period is known as the Paleo Indian. It extends from initial human occupation to an arbitrary end at 7,500 years ago. Human occupation of the area probably began at least 12,000 years ago after the retreat of the ice age glaciers. The initial inhabitants may have entered the area by coming down the coast in small boats.

During this time, the climate was cooler and wetter than it is today. Although researchers have stressed a terrestrial orientation and the hunting of big game for Paleo Indian peoples, this orientation is probably due to differential preservation of hunting implements and large mammal bones, and an incomplete knowledge of settlement patterns, site variability and site survival.

A population oriented towards marine and riverine resources was present during this period, although archaeological evidence is rare in the state. Many of the oldest sites in the area are located along major rivers, usually at prime fishing spots that often continued to be used into historic times. Archaeological remains demonstrating this orientation are found at nine and ten thousand-year old sites in California, Oregon and British Columbia.

It is likely that people during this time had a subsistence strategy oriented towards the generalized collection of fish, shellfish, plants and other resources, with occasional massive protein inputs from the hunting of large mammals. Sites from this period on forested lands are likely to be special purpose and small resource extraction sites.

Developmental Period (7,500 – 4,500 Years Ago)

With postglacial environmental stabilization, more complex societies arose, oriented to the extremely rich riverine and marine shoreline zones of the state. People adapted to specific microenvironments in their territory, with procurement strategies and settlement patterns changing through time as resources fluctuated.

The period from 7,500 to 4,500 years ago was warmer and drier than present. In Eastern Washington, marginal areas were abandoned and subsistence and settlement concentrated

on major river systems. However, there probably were few changes in resource availability in Western Washington and there seems to be a strong, smooth continuity in resource orientation and settlement from the late Paleo Indian to ethnographically observed patterns. Many of the sites of this period show continued use into ethnographic or even historic times. A few coastal refuse (midden) sites date from this period. The oldest at Dupont is 5,200 years old. This is probably a function of continued sea level rise, rather than representative of relative use of the resource. Sites from this period on forested lands are likely to be special purpose and small to moderate size resource extraction sites.

Ethnographic Period (3,000 – 200 Years Ago)

By 3,000 years ago, the Northwest Coast ethnographic pattern was fully established, characterized by large semi-permanent winter villages at lower elevations, seasonal forays to resource extraction sites and seasonal camps often at higher elevations. Economic orientation was primarily towards marine and riverine resources, but there was considerable economic specialization relative to specific resources found in each groups' area. The people developed food processing and storage technologies and complex trade and travel networks from the Pacific Coast to the Columbia Plateau.

Western Washington is abundant with riverine and marine resources. Salmon and other migratory fish were a major source of food and the focus of ceremonial and social life. Local economies specialized in specific resources with fur seal, elk, deer and even mountain goat playing dominant roles. Wood was the main building and tool-making material and knowledge of the properties of many species was extensive and specialized. Cedar was used for large plank houses and canoes. Alder was used for bowls and spoons. Cedar bark and other species were used for clothing, baskets and other objects. The basic social group was the extended family that stayed together during seasonal migrations to resource procurement areas.

Eastern Washington has a more arid, continental climate and more sparsely scattered resources. People depended on salmon and root crops as major food sources, supplementing these with berries, nuts and small and large game. The basic social unit was the mobile band, which was well adapted to the hunting, fishing and gathering of more widely dispersed resources. Winter structures were typically pithouses, made by excavating pits in the earth and constructing roofs out of poles and mats covered with earth. Seasonal shelters were built from pole and animal skins or woven mats. The introduction of horses in the 1700s profoundly altered the economic and social organization of the groups by facilitating travel, trade and transport over much greater distances.

A common practice in both Eastern and Western Washington was the large-scale manipulation of the landscape. The use of fire as a major landscape modification tool has not been extensively studied, but is well known. Its main purpose was to promote growth of root crops and to support environments favorable for deer, elk and other large animals. The landscape that greeted the earliest European explorers was largely human-created rather than in its original natural state.

HISTORIC

The arrival of Euro-Americans in the late 18th century significantly altered the health, social organization and culture of the Native Americans. The earliest Euro-American permanent settlement of the area was by fur traders. The Hudson's Bay Company and other trading companies constructed trading establishments throughout Washington, often near major Native American settlements. American settlers coming into the Pacific Northwest tended to settle near these trading establishments where they often displaced the Native Americans.

Most major Native American settlements and all major early Euro-American settlements were on navigable water. This is because they were the main transportation corridors. Early historic economies were predominantly extractive: logging, mining, shellfish gathering and salmon fishing.

Most private agricultural development of the state began with the federal Donation Land Claim Act (1850), Homestead Acts (1862) and similar laws that provided free land to settlers and promoted a swarm of immigration to the Pacific Northwest. Trails and roads soon connected settlements and commercial centers, and small towns gradually arose to provide for settlers' needs. In 1887, the completion of the transcontinental Northern Pacific Railroad opened the state of Washington to trade with the east.



Appendix E.

Draft Visual Management Procedure

PROCEDURE

Department of Natural Resources

Cancels: **PR 14-004-080 VISUAL MANAGEMENT, Aug 1999**

TK 14-001-010 MAINTAINING MATURE FOREST COMPONENTS, Sept 2004

PR 14-004-080 **VISUAL MANAGEMENT**

APPLICATION All Trust Forestlands.

DISCUSSION

The purpose of this procedure is to establish a process that integrates visual with financial and other important policy objectives in managing Trust forestlands. The Department manages Trust forestlands for revenue production while restoring and maintaining healthy and socially acceptable ecosystems. An important social concern is aesthetics. This concern creates a need for outcome-based landscape perspectives supported by silvicultural prescriptions that together balance management of aesthetics, revenue generation, and other imperatives, such as certain wildlife habitats and forest health.

Thus, when the region determines that aesthetic concerns exist, the following process shall be put into action.

Action

BNR policy requires the Department to first consider whether visual impacts of management activities are of local or regional significance. For local impacts, mitigation will generally be through FMU design alterations. For regional impacts, the primary means of mitigation will be through additional strategies considering the cost/benefit to trust beneficiaries of mitigation measures and foregone revenue. Lastly, when in the best interest of the affected trust(s), regions shall advise the Department to transfer ownership of scenic areas, as equitable.

The resulting visual management process shall incorporate the following major steps. Regions may perform this process incrementally, as warranted by emerging visual issues.

- **Step 1 – Recognize Potential Viewshed:** Delineate a potential viewshed. A viewshed should have a size and shape that includes only the viewable area (i.e., reverse sides

of hills not seen from vantage points or routes should be excluded), and must distinguish local from regional significance. Viewsheds shall be delineated as a part of the landscape perspective.

- Step 2 – Determine Objectives for the Potential Viewshed: Develop FMU objectives per PR 14-005-010 and landscape-level objectives based on how much of a viewshed must meet FMU objectives at any point in time.
- Step 3 – Adjust the Silvicultural Prescription: Meeting viewshed objectives should first be attempted through manipulation of FMU shape and size as well as placement of required leave trees. Prescriptions shall strive to maximize silvics of commercially valuable tree species in reforesting understories. Planted understory species shall conform to opening sizes reflected in current research or as presented in Department training as regards daylight requirements for survival and vigor of commercially valuable native tree species. Financial analysis shall compare mitigation to no mitigation, and, in the landscape management process, account for any timber harvest revenue permanently foregone.
- Step 4 – Validate: Once potential viewsheds and objectives are developed, the region shall be able to demonstrate the Trust mandate is duly served over time, and validated viewsheds shall be recorded in a Department-approved database.

In summary, regions shall establish viewsheds and corresponding aesthetic objectives in conformance with policy; information shall be recorded in a Department-approved database. In devising silvicultural prescriptions for viewshed FMUs, understory species shall be selected for potential future value and sustained vigor in the shade created.

APPROVED BY: _____
Gretchen Nicholas, Manager
Land Management Division



Appendix F. Biodiversity Pathways

By providing a range of forest structural stages, managed lands become more like natural forests in terms of their ability to support a diversity of wildlife species on a landscape or ecoregional scale. An approach for accomplishing this, proposed by the scientific community, is conservation of the biological diversity through manipulation of the stand structure. This approach is illustrated by biodiversity pathways (Carey and Curtis, 1996) as previously discussed and by variable retention harvest systems developed by Franklin (Franklin et al., 2002).

Carey et al. (1996) stated: “If we are to keep options alive for ourselves and for future generations, we must manage to conserve biodiversity. Conservation of biodiversity differs from single- or multiple-species management and single-commodity management. Biodiversity is different from species, taxonomic, structural, or habitat diversity. Conservation of biodiversity is the management of human interactions with the variety of life forms and ecosystems so as to maximize the benefits they provide today and maintain their potential to meet future generation’s needs and aspirations.” The Board of Natural Resources directed the department to implement biodiversity pathways in Western Washington in order to “simultaneously increase the production of trust revenue and complex forest habitat with a priority for habitat areas and across the landscape as appropriate” (Board of Natural Resources Resolution No. 1110, 2004).

The principal silvicultural strategies of biodiversity pathways are retention levels at final harvest, reforestation, thinning, and direct habitat quality improvements, e.g., snag/large woody debris creation, nest boxes, that target management of important stand cohorts in order to accelerate the structural development of each forest stand to best attain site-specific economic, ecological and social objectives. There will be a spectrum of various intensities of biodiversity and associated treatments that depend on the particular objectives for a stand or landscape.

Specific techniques include improved planting stock and variable density thinning. In variable density thinning, the stand is thinned to different residual tree densities, while snag and down woody debris cohorts are replenished. Heavy thinning treatments can typically result in less than 50 percent of the initial stand remaining after harvest. Also, some dominant trees are removed from the upper canopy to create sufficient space and gaps for the development of smaller trees (Carey et al., 1999). Without such thinning treatments in dense competitive exclusion stands, the density of dominant trees will not allow for the development of understory trees within the stand. Normally, these variable

density thinning treatments, both heavy and light, harvest across the diameter classes. For these reasons, variable density thinning does not necessarily result in lower stumpage rates than traditional thinning. The objective of variable density thinning and reforestation methods that encourage structural development is to increase the diversity of the trees that represent the largest cohort of trees within a stand.

A regeneration harvest will occur when landscape and stand objectives are met for a period sufficient in length to satisfy landscape objectives, i.e., revenue generation objectives are met and/or the stand has remained in a structurally complex state for a period of time that has allowed generation of another stand of sufficient structural complexity in the landscape. A regeneration harvest is the end of the rotation treatment before the stand is replanted or reestablished through natural regeneration.

The principles of the biodiversity pathways approach to silvicultural treatment (based on Carey et al., 1996, page 23) are to:

- Retain large-tree legacies (snags, large live trees and their epiphytes) and conservation of soil organic matter, seed banks and coarse woody debris and understory vegetation at harvest;
- Minimize site preparation, but under-plant widely spaced, site-appropriate and shade-tolerant species to supplement natural regeneration of tree and shrub species;
- Implement modified thinnings that retain patches and open up the forest canopy to encourage the development of a diverse and patchy understory that mimics that in old forests; and
- Directly improve habitat quality by creating cavity trees and adding coarse woody debris in the form of felled trees.

These principles call for a new silvicultural system that deliberately manages stand cohorts by rotation-length silvicultural prescriptions. Depending upon a stand's current condition, such as site and species composition, different combinations of treatments based on these principles would be applied at different stages during the rotation to maintain the stand on the desired pathway towards developing a structurally complex forest stand. The pathway is geared to optimally meeting these stand objectives.

The harvest treatments in the biodiversity pathways approach would typically be variable density thinnings that use a mix of heavy and light thinning, and regeneration harvests. The variable density thinnings would likely include a mix of heavily thinned areas, e.g., where less than 50 percent of the initial stand remains after harvest; lightly thinned areas, e.g., where more than 50 percent of the initial stand remains; small openings of approximately one-quarter to ten acres in size depending upon the stand conditions and objectives; and un-thinned areas.

Selecting the type of treatment and intensiveness of the thinning would be determined by site-specific conditions and stand objectives. For example, for the westside, analysis of current forest conditions, the riparian and wetlands areas and designated habitat management areas suggests that only about 35 percent of this area is suitable for long

(140-year) rotation silviculture with heavy thinnings. Suitability is defined as conifer-dominated stands that are not in a densely overstocked state. Thinning large-diameter closed (competitive exclusion) stands too heavily could lead to blow-down that may damage much of the existing forest structure, e.g., snags. In addition to the harvest treatments, the silvicultural prescriptions would likely include treatments to create and maintain snags, coarse woody debris and small openings.

Regeneration of stands within the biodiversity approach is determined by alternating maturity criteria. Forest stands with current conditions that can be managed with variable density thinnings on long rotations may have maturity criteria of 110 to 140 years, depending upon the site, species and stand objectives. Forest stands that are currently over-stocked, i.e., have too many trees, and are beyond response to thinning without undue risk are not conducive to longer rotations with variable density thinning. These stands have earlier maturity criteria, between 40 to 70 years depending upon site, species and stand objectives. After their regeneration, these stands will be managed over long rotations.



Appendix G.

Forest Resource Plan Update Scoping Summary

Forest Resource Plan Update Scoping Comments Summary

June 30, 2004

There are eleven sections within this Forest Resource Plan Update Scoping Comments Summary. The sections are as follows:

- I. Scoping Process and Summary Structure (page 1)
- II. Plan Need (page 2)
- III. Plan Purpose (page 2)
- IV. Management Objectives (page 3)
- V. Major Policy Categories (page 6)
- VI. New Issue Areas (page 6)
- VII. General Policy Considerations (page 7)
- VIII. 1992 Policy Content (page 8)
- IX. Environmental Impact Statement Analysis (page 13)
- X. Plan Structure and Organization (page 14)
- XI. Sustainable Harvest Calculation (page 15)

I. SCOPING PROCESS AND SUMMARY STRUCTURE

On March 15, 2004, the Department of Natural Resources (DNR) issued a Determination of Significance and Request for Comments on Scope of EIS (Scoping Notice) and held a series of statewide public workshops to obtain comments regarding the review and possible amendment of the policies in DNR's 1992 Forest Resource Plan (FRP) and for preparation of an Environmental Impact Statement (EIS). The comment period closed on May 17, 2004. The areas DNR requested comments on are as follows: need for updating the plan, purpose of the plan, a set of management objectives to guide policy review and development, major policy categories, new policy issue areas to be addressed, general policy considerations, 1992 policy content, and EIS analysis. Additional comments were received about the structure and organization of the updated FRP.

Sections II, III, IV and V, as outlined above, include preliminary decisions DNR has made related to the need to update the plan, the plan purpose statement, the management objectives, and the major policy categories, as a result of scoping. Under each section, there are four subsections: Scoping Notice Language; Summary of Comments; DNR's Response; and Updated Language. The Scoping Notice Language subsection contains the draft language that was issued in the Determination of Significance and Request for Comments on Scope of EIS; the Summary of Comments subsection contains a summary of the comments received through scoping; the DNR's Response subsection contains the preliminary decisions DNR

has made related to these elements; and the Updated Language subsection contains the updated language that reflects DNR's preliminary decisions as a result of scoping. Sections VI, VII, VIII, IX and X, as outlined above, contain summaries of the comments received on new issue areas to be addressed, general policy consideration, 1992 policy content, and EIS analysis, as well as the structure and organization of the updated FRP. These comments have also been considered by DNR in the revision of the plan need, plan purpose, management objectives, and major policy categories. As the process moves forward and reasonable alternatives are formulated, these comments will be reconsidered based on their merits of achieving the need, purpose and management objectives as outlined by the Board of Natural Resources (BNR) and DNR. Under each section, there are two subsections: Summary of Comments and DNR's Response. The Summary of Comments subsection contains a summary of the comments received through scoping; and the DNR's Response subsection outlines DNR's approach to the information received as part of the next phase of this effort.

Section XI contains a summary of comments related to the Sustainable Harvest Calculation (SHC).

II. PLAN NEED

Scoping Notice Language: A review and update of the Forest Resource Plan (FRP) is needed to keep pace with the changes shaping forestland management today. When adopted in 1992, the FRP was envisioned as a 10-year document. In 2002, the policies in the FRP were extended for an additional three-year period so that DNR could complete a western Washington Sustainable Harvest Calculation (SHC), the first step to revising the 1992 FRP. The revision of the FRP will position the Department of Natural Resources (DNR) to effectively and sustainably manage the trusts' forestland for the trust beneficiaries and the people of Washington, into the future.

Summary of Comments: No comments were received on the proposed need.

DNR's Response: The need statement to update the FRP is sufficient as written. No updated language is proposed at this time.

III. PLAN PURPOSE

Scoping Notice Language: To conserve and enhance the natural resources of state forestland while producing long-term, stable income from these lands.

Summary of Comments: 1992 Forest Resource Plan (FRP) purpose should be retained; the current purpose is backwards and should state the obligation to the trusts first and foremost, e.g., "the purpose of the FRP is to ensure production of long term, stable income from trust lands, while conserving and protecting natural resources on these lands"; the highest environmental principles should guide the purpose; and "other benefits" should be included after "stable income" to reflect benefits to the trusts other than income that might accrue, (e.g., K-12 outdoor classrooms) and benefits that are produced for the general public, consistent with producing trust revenue.

DNR's Response: The proposed purpose statement as worded accurately reflects the relationship between maintenance of a healthy and functioning ecosystem and the resulting ability to produce long-term, stable income. However, it is equally important to recognize the fiduciary nature of these trust lands, suggesting that the maintenance of a healthy and functioning ecosystem and its ability to produce revenue must be carried out in a manner that

is consistent with these fiduciary standards. It is also important to note that in addition to the benefits that flow from income production, environmental and other social benefits flow to the people of Washington. Therefore, DNR modified the purpose statement to reflect these considerations.

Updated Language: Consistent with the fiduciary standards governing trust management, conserve and enhance the natural systems and resources of state forests to produce long-term sustainable income, environmental, and other benefits to all the people of Washington.

IV. MANAGEMENT OBJECTIVES

Scoping Notice Language:

1. Meet all federal and state legal mandates, including the trust mandate and the contractual obligations of the Habitat Conservation Plan.
2. Incorporate polices adopted by the BNR as part of the 2004 sustainable harvest calculation for Western Washington, and articulated in BNR Resolution 1110.
3. Promote active and sustainable management of as much of the forested land base as allowed by law (including the HCP) and utilize forestry practices to a) best meet trust fiduciary responsibilities, b) maintain a diverse and productive healthy forest system, c) protect sensitive areas and habitats, and d) provide social and cultural benefits compatible with a, b, and c above.
4. Promote innovative and creative ways to capture existing or future timber and non-timber economic opportunities, compatible with fiduciary responsibilities.
5. Identify forested trust lands that provide special ecological, social, or cultural benefits (beyond direct financial returns to the beneficiaries) that conflict with active management, and protect such areas through creative partnerships and funding mechanisms compatible with fiduciary responsibilities.
6. Include a program that provides for monitoring and periodic reporting to the BNR on the implementation of BNR-approved policies and desired outcomes. Monitoring will also help identify needed changes in policies and DNR practices to better meet trust and BNR objectives.
7. Taken collectively, policies should communicate the role of managed state forested trust lands in Washington State, and the benefits these forests provide to the trust beneficiaries and the people of Washington.
8. Provide for efficient and cost-effective application, implementation and ease of understanding of BNR policy regarding the acquisition, management, and disposition of all state forested trust lands and resources, and promote alignment of implementation tools (planning, operational tools, and public involvement) with policy.
9. Provide a flexible framework within which DNR may use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship.

Summary of Comments:

General comments about the proposed Management Objectives (MOs) included the following: there is an appearance of internal conflict in the MOs that needs to be resolved; some of the MOs appear to erode the trust mandate (MO Nos. 3, 5 and 7); not actively managing some lands may still support the trust mandate; active management must still be in compliance with state and federal laws and the Habitat Conservation Plan (HCP); contractual obligations in the HCP should be fully integrated, as well as the “Bergeson Principles” that guided the BNR’s identification of a Sustainable Harvest Calculation (SHC) preferred alternative; and the MOs are silent on recreational use of state trust lands and fail to provide the necessary basis for developing policy for management of trust lands as a recreation resource for the people of Washington.

MO No. 1 should be amended to encourage exceeding legal mandates where it would help meet the FRP purpose similar to Policy No. 30 in the 1992 FRP.

MO No. 2 violates the most primary duty of every trustee, to preserve the assets of the trust. These policies overemphasize the short and long term financial return to the beneficiaries. The increased harvest and clear cutting under these policies will degrade the ecosystem.

MO No. 3 has priorities that are not consistent with the current stated purpose and should be reordered to align with the purpose. Maximizing the area under “active and sustainable management” may not be consistent with conserving and enhancing the natural resources. The distribution of forested trust lands managed for commercial production, for restoration and for protection requires careful balancing of environmental concerns with the production of income as well as the needs for both the current and future beneficiaries.

MO No. 4 needs to be creative and innovative in capturing existing and future timber and non-timber economic opportunities, compatible with fiduciary responsibilities. In doing so, do not disturb the balance described in No. 3.

MO No. 5 needs to better identify, define and protect old growth forests using verification modeling and mapping. HCP definition is insufficient. The county trusts should be compensated for meeting social goals. It should not be implied that all areas unsuitable for active management must be purchased from the trusts; DNR has a responsibility to protect public resources.

MO No. 6 needs to include a program that provides for monitoring and periodic reporting to the BNR on the implementation of BNR approved policies to identify needed changes in policies and DNR practices to meet trust and BNR objectives. Any new monitoring efforts should be closely integrated with existing monitoring efforts. Information from monitoring should also be shared with the public and agency employees.

MO No. 7 needs to outline that the benefits provided should be targeted and limited to the trust beneficiaries. “...And for the people of Washington” should be stricken from this objective.

MO No. 8 needs to be clarified and simplified. Create a policy that deals specifically with the conversion of DNR timberland to other uses such as residential or commercial.

MO No. 9 needs to be amended to include cooperation with local communities and the interested public. Specific measurable requirements provide the sideboards of the flexible

framework. Flexible frameworks need to be combined with measurable outcomes and firm timelines to ensure employee direction and coordination.

There were also several recommendations for additional MOs to be considered, some of which included the following: promotion of healthy ecosystems including experimentation with innovative forestry techniques; the need to aggressively seek funding to accomplish all legal mandates, management objectives, and policies; and seek a third party system of Forest Stewardship Council certification to maintain sustainable forestry.

DNR's Response: In response to comments received through scoping and after additional consideration, DNR made a number of changes to the proposed MOs and modified the order in which they are presented.

Updated Language:

1. Meet all federal and state laws, including the trust obligations and the contractual commitments of the Habitat Conservation Plan.
2. Balance trust income, environmental protection, and other social benefits from four perspectives: 1) the prudent person doctrine; 2) undivided loyalty to the trust beneficiaries; 3) intergenerational equity; and 4) not foreclosing future options.
3. Ensure policies provide succinct, relevant and practical guidance to department employees.
4. Seek productive partnerships that help achieve management objectives.
5. Use professional judgment, best available science and sound field forestry to achieve excellence in public stewardship.
6. Pursue outcome-based management within a flexible framework.
7. Promote active, innovative and sustainable stewardship on as much of the forested land base as prudent.
8. Identify trust lands that provide special ecological, social, or cultural benefits that are incompatible with active management, and look for opportunities to protect such areas through creative partnerships and funding mechanisms.
9. Capture existing and future economic opportunities for the beneficiaries from the forestland base by being prudent, innovative and creative.
10. Monitor and periodically report to the Board of Natural Resources on the implementation and outcomes of Board of Natural Resources' approved policies.

V. MAJOR POLICY CATEGORIES

Scoping Notice Language: Economic Performance; Ecological Protection and Enhancement; Social and Cultural Benefits; and Creating Sustainable Forests.

Summary of Comments: The four proposed major policy categories are reasonable and appropriate; there needs to be balance between each of these four categories; dividing the policies into categories like this may counter or bifurcate the Department of Natural

Resources (DNR) and Board of Natural Resources (BNR) goal of balancing social, economic and environmental benefits; there is overlap between these four categories; the FRP needs to describe the interrelationship between each of the categories; the Ecological Protection and Enhancement category should be renamed to Environmental Protection; the Creating Sustainable Forests category should be renamed to Forest Management, Suitable Forest Management, or some other clearer terminology; and there should be an additional category that deals with timber, marine and agriculture trust product purchasers, e.g. policies related to product sales, sales terms, timing and conditions, ancillary fees, etc.

DNR's Response: DNR will use the updated major policy categories for document organizational purposes. The updated policies within the revised FRP will be considered as a whole and implemented collectively. There is overlap between the categories, which will be addressed in the introduction section of the FRP, as well as throughout the FRP. Ecological Protection and Enhancement goes beyond environmental protection, in that it includes improving the health and productive capacity of forest ecosystems. For clarity and ease of understanding, the Creating Sustainable Forests category has been renamed.

Updated Language: Economic Performance; Ecological Protection and Enhancement; Social and Cultural Benefits; and Implementation.

VI. NEW ISSUE AREAS

Summary of Comments: There were several recommendations for new issue areas to be addressed in the updated Forest Resource Plan (FRP). Some of them included: expanding the Department of Natural Resources (DNR) outreach, communication, education and partnerships; addressing forestland conversions for urban uses; forest certification; addressing the relationship between the trust mandate, the policies and the management objectives; pursuing the blocking-up of lands; full-cost accounting measures; reinvestment of funds after sales; aesthetics; assessing risk; special use permitting system to track non-timber related uses on DNR lands; temporary roads; contracting services; motorized vehicle use for recreation; invasive species and their spread through grazing, logging, road construction, open roads and motorized recreation; forestland grazing; litter collecting by inmates on forestland; Clean Water Act; catastrophic events; and maintaining the land base to produce income.

DNR's Response: DNR will consider each of these new issue areas to determine if they warrant a policy-level statement or if they are more procedural in nature, whether they are outside of the scope of this effort, whether they are addressed in other DNR policy documents, and whether addressing the issue with a policy statement would help DNR better meet the need, purpose and management objectives of the updated FRP.

VII. GENERAL POLICY CONSIDERATIONS

Summary of Comments: DNR needs to consider the following when reviewing and developing policies: ecological and financial risk; cost-effectiveness; ease of implementation; best available science; the differences between Eastern and Western Washington; assessing the collection of policies as a whole, not individually; and striking a balance between high-level direction versus on-the-ground implementation.

In addition, the policies need to provide the following to DNR personnel: flexibility; efficiency; clear direction; ease of understanding; guidance for implementation; and the ability to use professional judgment and sound field forest management.

A number of comments were received regarding economic performance. Some of the comments included the following: be true to the trust mandate and fiduciary responsibilities and not other broader social goals; acquisition and disposal of lands needs to be managed more aggressively; trust beneficiaries need to be treated equally in the annual cut; there is a need to balance revenue and to protect assets for future generations; intergenerational revenue; revenue needs to be maximized and sustainable; recognize the cost of creating habitats; economic development includes tourism and recreation on state lands; use full-cost accounting and not net present value; examine world markets for additional revenue opportunities; look for a niche that DNR can fill; provide a consistent supply of wood and the markets will follow; consider the revenue impacts of timing and seasonal restrictions; charge user fees for recreational activities; the Eastern Washington sustainable harvest should occur after the forest Resource Plan is updated and should be based on actual on-the-ground methodologies; the Eastern Washington trust lands are decades behind on thinning and other treatments necessary to give maximum yield, so the sustained yield should reflect the decades of neglect the forests have suffered; clarify the use of the Access Road Revolving Fund; and pursue land transactions to improve economic performance and move trust lands that meet federal objectives (i.e., roadless areas, old growth, etc.) to appropriate federal agencies.

A number of comments were received regarding ecological protection and enhancement. Some of the comments included the following: DNR should protect lands that are more valuable as conservation areas; DNR should look at the entire range of ownerships and management regimes, i.e. private, state and federal, when assessing wildlife habitat and landscape planning; DNR needs to consider impacts of global warming, climatic shifts, and drier conditions; DNR needs to consider a variety of silvicultural approaches to ensure long-term environmental protection and forest health; DNR needs to consider impacts on water quality and quantity; DNR needs to address wildlife corridors and the needs of ungulate populations; and DNR needs to preserve the diversity of plant life.

A number of comments were received regarding social and cultural benefits. Some of the comments included the following: state trust lands should be managed for all the people, not just timber companies; long-term public benefits must outweigh any short-term profits; population growth will require increased funding for school construction; and local economies and rural communities depend on a healthy wood products industry.

A number of comments were received regarding implementation. Some of the comments included the following: DNR needs to find the most efficient means for timber harvest, in compliance with regulatory and contractual obligations to maximize revenue to the trusts; provide necessary field guidance; the role of managing state forested trust lands and the benefits should be clearly communicated to the citizens of Washington; use generally accepted management practices until untested practices are proven effective; DNR should actively test new means of managing forests; DNR should work with private forest landowners and look at their technologies, practices and efficiencies; manage uneven-aged stands, rather than all single-aged stands; and prioritize measures that restore diversity to state forests; DNR should encourage and support professional organizations and employee membership.

Finally, DNR received many requests by various stakeholder groups to allow for review and input of the draft policies prior to going to the Board of Natural Resources (BNR) for discussion.

DNR's Response: When reviewing and developing policy alternatives, DNR and the BNR will reconsider the above-mentioned concerns that are within the scope of this effort as set out by the plan need, plan purpose and management objectives for the FRP review and

update. In addition, in response to the requests made by various stakeholders to allow for review and input on the draft policies, DNR will be hosting focused stakeholder outreach workshops in early August. While DNR will not have actual draft policy language at this point, DNR would like to obtain input at these workshops on alternative policy approaches that may be evaluated in the Environmental Impact Statement (EIS) and discussed with the BNR.

VIII. 1992 POLICY CONTENT

Summary of Comments:

No. 1: Federal Grant Land Base. This policy needs to be updated to provide financial vision.

No. 2: Forest Board Land Base. No comments were received on this policy.

No. 3: Land Classifications. This policy needs to be updated to include the following: a definition and discussion about on base and off base lands, general uplands, and temporary and permanent deferments.

No. 4: Sustainable, Even-Flow Timber Harvest. This policy needs to be updated and include the following: a discussion about arrearage, ramp-up, and how DNR will achieve the Sustainable Harvest Calculation (SHC) level.

No. 5: Harvest Levels Based on Volume. This policy needs to be updated and include the following: a definition of the difference between volume and value, needs to be succinct, and needs to outline the responsibility to the trusts.

No. 6: Western Washington Ownership Groups. This policy needs to be updated to include support of sustainable harvest calculations for each individual Forest Board counties.

No. 7: Eastern Washington Ownership Groups. This policy needs to be updated to include support for the use of an ownership grouping, which provides sustainable harvest calculations for each individual county.

No. 8: Special Forest Products. This policy needs to be updated to include the following: non-timber revenue opportunities, i.e. Christmas tree production, brush sales, salal, cedar, and forest botanicals; and an evaluation/economic analysis of the value of special forest products.

No. 9: Forest Health. This policy needs to be updated to include the following: a definition of forest health; an assessment of conditions; a discussion about slash burning, control of insects, prescribed fire, catastrophic events, recent state and federal legislation; consideration of salvage sales, protection of future forests, additional funding mechanisms for innovative forestry techniques, variable density thinnings, extended rotations, conservation of biological legacies; and an outline for forest rehabilitation.

No. 10: Fire Protection. This policy needs to be updated to include the following: a discussion on whether this policy has contributed to forest health issues, how to speed up the process for timber salvage after fire, the relationship between DNR and community-based fire plans; an analysis of the costs and effectiveness of fire suppression and the fire program; and an environmental critique of impacts associated with post fire and timber harvest.

No. 11: Managing On-Base Lands. This policy needs to be updated to explain how DNR will meet their fiduciary responsibility on production lands, while meeting biodiversity pathway standards.

No. 12: Annual Review of Financial Assumptions. No comments were received on this policy.

No. 13: Special Ecological Features. This policy needs to be updated to include the following: a discussion on how Natural Area Preserves and Natural Resource Conservation Areas are funded and managed; and outline what lands have been taken out of trust ownership because they have “special ecological features that fill critical gaps in ecosystem diversity” since the 1992 FRP.

No. 14: Old Growth Research Area Deferrals. This policy needs to be updated. General comments included the need to define, quantify, locate and map old growth; a discussion on how much old growth has been cut or set aside since 1992, what lands are associated with these deferrals and define the deferral period, and the role of the Habitat Conservation Plan (HCP) in old growth protection. There were also a number of comments related to setting aside old growth. Some of these included the following: DNR should not harvest any old growth or mature stands; if old growth is set side, the trusts need to be compensated for it; older stands of trees are a tourist attraction and recreational benefit; larger trees provide the best genetic stock for tree seedlings and erosion protection; old growth is not a renewable resource; creation of old-growth structure is not a substitute for actual old growth; old growth is imperative to the protection of rare and endangered species; save, screen and transfer old growth lands adjacent to federal lands to the appropriate federal agency; distribute old forests across all of the WRIAs in the planning unit; and do not harvest any trees over 16” in diameter. In addition, there were a number of comments related to the management and harvesting of old growth as part of the commercial forestland base.

No. 15: The Genetic Resource. No comments were received on this policy.

No. 16: Landscape Planning. There were comments that indicated this policy has not been followed or implemented as intended. This policy needs to be updated to include the following: an analysis of how the 1992 policy has worked; DNR should initiate landscape planning that takes recreation, clean water, wildlife needs and aesthetic views into consideration to produce management plans that meet the needs for all of the citizens of the state; use measurable timelines and milestones; define how the SHC and FRP are related; landscape plans need to be implemented at a finer scale than HCP planning units to be effective; view trust lands in the context of surrounding landscapes and consider what the landscape should look like in 20, 50 and 100 years; landscape planning seems to be driven more by public impact than trusts’ interests; there should be integration between policies Nos. 16 and 19; consider wildlife and all ownerships when landscape planning; landscape and watershed level planning are important to forest health and are viable to wildlife population; landscape planning is an important element of HCP implementation; landscape plans should allocate lands for wildlife needs and other HCP commitments; landscape planning should cover an area no larger than a Water Resource Inventory Area (WRIA); and WRIAs should serve as a minimum scale of landscape planning.

No. 17: Soliciting Information. There were comments that stated this policy has not been followed or implemented as intended. This policy needs to be updated to ensure implementation and to outreach to conservation groups when soliciting comments.

No. 18: SEPA Review. This policy needs to be updated to include the following: an analysis of DNR's consideration over the past 12 years of cumulative effects of past, present and proposed activities during State Environmental Policy Act (SEPA) reviews; performing SEPA for an annual action plan, instead of each individual timber sale; assessing efficiency of SEPA review and clarify processes, i.e. who is responsible for what within DNR; and the need for reliable data sources with clarification and consistency on what data source is being used.

No. 19: Watershed Analysis. There were comments that indicated this policy has not been followed or implemented as intended. This policy needs to be updated to include the following: an analysis of whether the 1992 policy effectively improved and protected the aquatic network; watershed analysis needs to be operational and practical, not duplicative with the HCP and other policies; eliminate the 50/25 procedure, as it conflicts with implementation of the HCP, a reduction of management flexibility, reduced harvest volumes and little added environmental protection; watershed analysis plans must be completed and DNR needs to evaluate the cumulative effects of all management within each watershed and base management decisions on these watershed analyses; determine and describe a process of completing watershed analysis; there should be integration between policies Nos. 16 and 19; and expanded to examine the effects of forest practices on Washington State marine environments.

No. 20: Riparian Management Zones. This policy needs to be updated to include the following: an analysis of the positive and negative effects of buffering; the changes as a result of the HCP and Forests and Fish; encourage active management of riparian zones; identify fish blockages on county roads and state highways; inclusion of a mandatory 100 foot riparian management zone along both sides of all Type 5 waters; riparian protection requires a broader understanding of watershed conditions and processes which will guide appropriate Type 5 protection strategies; analyze the effects of forest practices on marine environments; and establish a minimum level of funding that is needed to effectively implement DNR responsibilities for watershed planning.

No. 21: Wetlands. This policy needs to be updated to include the following: a discussion on how effective the 1992 policy was related to protecting wetlands as part of the assessment of current conditions and needs to identify any loss of wetlands since 1992.

No. 22: Wildlife Habitat. This policy needs to be updated to include a discussion on how the 1992 policy worked over the last 12 years.

No. 23: Endangered Species. This policy needs to be updated to include the following: a description of how the 1992 policy has maintained populations of wildlife species and prevented them from becoming listed as endangered or threatened; identify the list of species that need protection; provide a proactive approach to wildlife habitat conducted across all land ownerships; promote natural species diversity; protect threatened and endangered plant species, especially on the Eastside; and implement intensive field inventories before doing a timber sale and protect species and habitats.

No. 24: Identifying Historic Sites. This policy needs to be updated to include the following: creating systematic cultural resources surveys that identify archaeological sites, areas of traditional value, sacred sites, locations with Indian place names, resource gathering areas, prior to any and all ground disturbing activities within state-managed trust lands, include fire rehabilitation activities; setting all cultural resource sites officially off base; communicating with the tribes on all timber sales in areas of cultural importance; assessing the progress that

has been made on the TRAX system in the past 12 years; and allowing access for hunting and gathering.

No. 25: Providing Public Access. This policy needs to be updated to include the following: direction for how DNR can work with user groups to better manage trust forest lands for off-road vehicle use; this policy should be made secondary and subordinate to the trust mandate of maximizing revenue to the trust beneficiaries and include clear and concise language that prevents the existence of a recreational trail from controlling timber management activities; and “recreation activities are not providing money to the trust beneficiaries, thus they should not control the land.”

No. 26: Granting Public Rights of Way. This policy needs to be updated to include the following: explanation of whether or not DNR will accept forest legacy easements or property with conservation easements; explanation of whether or not DNR grants permanent easements; and provide easements with appropriate lease rates for public safety, i.e. communication sites.

No. 27: Acquiring Rights of Way. No comments were received on this policy.

No. 28: Developing and Maintaining Roads. This policy needs to be updated to include the following: a discussion about roadless lands and not building new roads in roadless areas; an update to be in compliance with the HCP; the additional requirements for environmental protection; the Forest Practices Rules upgrades; a summary of how many roads DNR manages and how this has changed since 1992; and consider how road design and location to protect the environment may be resulting in increased road mileage (e.g., ridgetop locations instead of stream adjacent).

No. 29: Recreation on State Forest Lands. This policy needs to be updated to include the following: clear policy direction that recognizes the importance of DNR trust land as a motorized recreation resource that provides support for managed off-road vehicle recreation; direction for DNR to work with user groups to better managed trust forest lands for off-road vehicle use in a manner that does not compromise trust fiduciary responsibilities, that meets the needs of the increasing off-road vehicle community, and protects the environment; specifically address the importance of forested trust lands for multiple use recreation; DNR lands are the ideal place to accommodate motorized recreation, as these forest areas generally contain many roads as a result of forestry activities and already contain modifications to natural areas and habitat; motorized recreation can occur on DNR trust lands without significantly impacting the land and its use for forestry, provided the recreation use is managed; this policy should be made secondary and subordinate to the trust mandate of maximizing revenue to the trust beneficiaries and include clear and concise language that prevents the existence of a recreational trail from controlling timber management activities; address the criteria for keeping lands available for public use and flexibility for closures when abuse occurs on the land; address enforcement issues and the need for additional law enforcement staff; address recreational shooting; creating a system of stewardship by particular use, trail or campground; address the increasing demand for public use on state lands and the growth since the 1992 plan, as well as the closure of public lands; recreation and trust mandate are not mutually exclusive; address where Non-highway Off-road Vehicle Account (NOVA) funds are spent and involve user groups in where the money goes; address the option of user fees or daily use fees to maintain access; define multiple use; recreation activities are not providing money to the trust beneficiaries, thus they should not control the land; evaluate implications of recreation to timber operations; create partnerships with volunteers; describe how to accept donations for recreation; include a reference to horseback riding and off highway vehicle use; promote conversion of abandoned roads to trail systems;

preserve trails after harvesting; partner with local recreational businesses for upkeep of lands; recreation is a cornerstone of life in Washington and state trust lands are critical areas for local and regional recreation; consider trends and anticipate demands for recreation management decisions; and consider recreation as an opportunity for citizens to enjoy state lands.

No. 30: Silviculture Activities. This policy needs to be updated to include the following: an analysis of the 1992 policy and what the results of an updated policy will be; define how DNR will intensively manage the land base to optimize production and revenue; introduce plants for medicinal purposes; protect, monitor and identify chemical treatments; and test and implement innovative silvicultural techniques to restore forest health.

No. 31: Harvest and Reforestation Methods. This policy needs to be updated to include the following: HCP and anticipated biodiversity pathways practices; include Forest Stewardship Council (FSC) certification; and test and implement innovative silvicultural techniques to restore forest health.

No. 32: Green-up of Harvest Units. This policy needs to be updated to include the following: reflect current forestry practices; address 100-acre green up limit; 1992 language is too prescriptive; interject more flexibility; include FSC certification; and test and implement innovative silvicultural techniques to restore forest health.

No. 33: Control of Competing Vegetation. This policy needs to be updated to include the following: consulting with local tribes before using chemical treatments; the increased scrutiny of pesticide use and the impacts to forest health; and a discussion of what methods DNR uses for vegetation control, how often each method is used, and whether or not these methods have increased forest health and structure.

No. 34: Fertilizing, Thinning and Pruning. This policy needs to be updated to include the following: how often each method is used, and whether or not these methods have increased forest health and structure; and a discussion about the financial benefits of healthy forests in the long-term to be consistent with the proposed increase in thinning and implementation of biodiversity pathways.

No. 35: Public Involvement. No comments were received on this policy.

No. 36: Implementing the Forest Resource Plan. This policy needs to be updated to include the following: aggressively seek funding to fully implement enforcement, monitoring, landscape planning, wildlife habitat management, and forest restoration activities; address how to resolve conflicts between policies if they arise; discuss the increasingly complex task of managing state forest lands and how DNR will ensure that funding is available to implement the new policies; ensure that all stakeholders are engaged; provide good direction to the field staff; and align procedures with policy to have a smooth and seamless implementation.

No. 37: Monitoring the Forest Resource Plan. This policy needs to be updated to include the following: monitor the different land uses and show how the use contributes to management objectives; HCP needs to underlie everything in the FRP; identify performance targets with qualitative milestones to be measured; assess cumulative effects with measurable targets and criteria; BNR should annually review silvicultural investments and periodically review performance; address budgetary issues of monitoring; and implement a process for reviewing the performance of the FRP over time.

No. 38: Modifying the Forest Resource Plan. This policy needs to be updated to include the following: include a strong adaptive management program to facilitate and accommodate change; and allow flexibility for making changes to the plan, rather than every 10 years.

No. 39: Consistency. This policy needs to be updated to include the following: provide a linkage between the Forestry Handbook, HCP, Transition Lands Plan, Asset Stewardship Plan and the FRP and ensure integration between them and avoid contradictions; acknowledge existing plans and provide consistency; and discuss and provide guidance on DNR's implementation plans as a result of SHC.

No. 40: Research. This policy needs to be updated to include the following: expand DNR's focus on the marine aspects of watershed planning and research is especially critical in Washington State where forest practices have such a strong impact on Puget Sound and the coast.

DNR's Response: As the process moves forward and reasonable alternatives are formulated, these comments will be reconsidered based on the merits of achieving the plan need, plan purpose and management objectives as outlined by the BNR and DNR.

IX. ENVIRONMENTAL IMPACT STATEMENT ANALYSIS

Summary of Comments: The Environmental Impact Statement (EIS) should include the following: an analysis of the outcomes of the 1992 policies, whether they were met, and the resulting practices; consideration for managing Eastern Washington state forestlands as forests and not plantations; consideration of how DNR management of its Eastern Washington forestlands will provide sufficient stream flow to meet wildlife, irrigators, and societal needs for the life of the next Forest Resource Plan (FRP); consideration of a mechanism to monitor the ongoing plan objectives for the next lifespan of the FRP; examination of the role forest pathogens and insects have in a forest setting; analyze and discuss the various certification options and discuss the pros and cons of certification; analyze an alternative that commits to producing high-quality timber grown on longer rotations and certified under Forest Stewardship Council (FSC) standards; analyze an alternative that commits DNR to exploring new potential revenue sources, such as carbon sequestration credits, and to ensuring that today's management will not preclude those future options; analyze an alternative that commits to protecting all existing old-growth forests that are currently unprotected by other measures, such as state Forest Practices rules or the Habitat Conservation Plan (HCP); analyze and discuss monitoring and monitoring reports for every aspect of trust land management; analyze how threatened and endangered species in Eastern Washington are being protected; consideration of options to dispose, trade or sell lands in Eastern Washington that have unmarketable trees; analyze all alternatives under the full-cost accounting method to evaluate forest management options for their impacts on intergenerational equity and to help guide DNR and Board of Natural Resources (BNR) decisions; analyze the entire aspect of post-fire harvest and include an informed discussion on the pros and cons, and the scientific substantiation of the policy decisions; analyze an alternative the commits to using landscape planning to mitigate the cumulative effects of multiple logging operations; analysis of how the HCP relies on landscape planning and watershed analysis and how these plans will be completed; analyze and discuss the impacts of off-road vehicles; analyze the trends in recreational use over the past 10 years and if there have been impacts; analyze the scrutiny of pesticide use, particularly in riparian areas adjacent to salmon bearing streams; analyze how to mitigate or avoid adverse impacts of DNR forest management on adjacent federal roadless areas or Wilderness; analyze invasive species, i.e. spread of noxious weeds, impacts of land-management activities on spread of

invasive species, grazing, logging, road construction, existing roads, motorized vehicles and herbicides; and analyze impacts of roads and road systems.

DNR's Response: DNR will revisit these comments when beginning the drafting of the EIS to ensure that the range of impact analysis and range of alternatives covers the significant impacts of the policy choices being evaluated. These will be dictated by the scope of the plan need, plan purpose and management objectives for the FRP review and update.

X. PLAN STUCTURE AND ORGANIZATION

Summary of Comments: The updated Forest Resource Plan (FRP) should include the following: discussion about funding and staffing available to implement the policies; description of how the HCP, SHC and FRP relate; description of the relationship between all of DNR's planning efforts; discussion about how the 1992 plan worked and what was accomplished over this time-period; update the Income Generated chart; an annual report page that documents how much money has been brought in and where the money has gone, specifically, not clinically, like the 1992 FRP; discussion on what happens when objectives and goals are not met; move the trust mandate section to the front of the FRP; discussion about recreation; statistical information that outlines the volume from 50 years ago compared to today; create a glossary of terms that defines sustainable harvest, biodiversity pathways, multiple use, sustainable forestry, innovative silvicultural techniques, GEMS, old growth, arrearage, and wetlands; and discussion about the costs of trust land management with a goal of improving efficiencies.

DNR's Response: The updated FRP will be restructured to better reflect the existing and anticipated future forestland management environment. A significant amount of information in the 1992 FRP will be reused, updated, and rewritten. DNR will look for opportunities to incorporate the above suggestions throughout the update. In addition, the layout will be reorganized in a manner that best suits DNR staff and other users and readers. A glossary of terms will also be included in the updated FRP.

XI. SUSTAINABLE HARVEST CALCULATION

DNR received a number of comments regarding the SHC that are addressed in the SHC Environmental Impact Statement (EIS). DNR also received a number of comments regarding the potential need for recalculation of the sustainable harvest level based on any changes in policy that the Board of Natural Resources (BNR) might make as part of the updated Forest Resource Plan (FRP) process. It is not expected that these changes would significantly impact the sustainable harvest level and the decisions the BNR has already made. However, if it appears that the harvest level may be significantly affected, DNR will evaluate whether it should be adjusted.



Appendix H.

Glossary

ASSET PERFORMANCE SYSTEM (APS)

Computer system developed by the department to manage various division contract agreements, securities, improvements, and product assets of the department. Replaces AIMS.

BIOLOGICAL DIVERSITY (BIODIVERSITY)

The relative degree of abundance of wildlife species, plant species, communities, habitats or habitat features in an area.

BIODIVERSITY PATHWAYS

An approach to achieving goals of biodiversity conservation which is “the management of human interactions with the variety of life forms and ecosystems so as to maximize the benefits they provide today and maintain their potential to meet future generations needs and aspirations” (Reid W.V. and K.R. Miller, 1989, Keeping options alive: the scientific basis for conserving biodiversity. World Resources Institute, Washington, D.C.). The term “biodiversity pathways” was popularized by Andy Carey, a United States Department of Agriculture Forest Service Pacific Northwest Research Station scientist in the Washington Forest Landscape Management Project (Carey et al., 1996) as an approach that employs traditional silvicultural techniques and field craft and applies them to specific forest management unit objectives of biodiversity and habitat conservation while also incorporating revenue generation. The concept of biodiversity pathways conveys that forest stands evolve by events, or absence of events, and are otherwise constrained only by site productivity potential. Absent human influence, such events occur by chance; in managed stands they occur largely by design. For example, a given forest management unit objective, such as habitat for the northern spotted owl, may take anywhere from less than a century to upwards of a millennium to develop along chance-driven natural pathways. This spectrum of possible pathways ensues from circumstances associated with stand origin (fire, wind, snags and down logs, seed-fall, species, etc.) and stand development (spot fires, wind, insects, disease, pre-European human intervention, etc.). The time required to attain functioning habitat may often be considerably reduced if developed and managed by design rather than by chance-driven events. Thus, biodiversity pathway and silvicultural prescription concepts may be considered too largely synonymous in their application and meaning. A silvicultural prescription is the optimal pathway, within nature’s limits, to attain forest management unit objectives; it employs accelerated means (planting, vegetation management, and thinning) to guide stand development along the desired pathway. (Variable density thinning is an activity

that accelerates biodiversity pathway prescriptions towards achieving spotted owl habitat.)

BOG

A hydrologically isolated, low nutrient wetland that receives its water from precipitation only. Bogs typically have no inflow and rarely have outflows. Bogs have peat soils 16 or more inches in depth (except where over bedrock), and specifically adapted vegetation, such as sphagnum moss, Labrador tea, bog laurel, sundews, and some sedges. Bogs may have an overstory of spruce, hemlock, cedar or other tree species, and may be associated with open water.

CLEAN WATER ACT (WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972 AND CODIFIED AS 33 U.S.C. 1251 ET SEQ.)

A federal statute that regulates water quality standards, planning for water pollution control and pollution discharge. Washington’s Forest Practices Rules (WAC 222-22) are constructed accordingly.

CLEARCUT

As defined in state Forest Practices Rules (WAC 222-16-010) is a harvest method in which the entire stand of trees is removed in one timber harvesting operation. For purposes of trust forestland management, a clearcut remains such until stocked in accordance with the silvicultural prescription and free-to-grow.

DESIRED FUTURE CONDITION

According to state forest practices rules (WAC 222-16-010), is a reference point on a pathway and not an endpoint for stands and implies the stand conditions of a mature riparian forest at 140 years of age, the midpoint between 80 and 200 years. Where basal area is the only stand attribute used to describe 140-year old stands, these are referred to as the “target basal area.”

DESIRED FUTURE/FOREST CONDITION

A variation of desired future condition which, for purposes of silvicultural prescriptions, is used to illustrate a visionary, un- or partly defined end state as contrasted with a completely defined forest management unit objective, i.e., threshold targets are either lacking or incomplete.

DOWN WOODY DEBRIS

Large pieces of wood in stream channels or on the ground such as logs, pieces of logs and large chunks of wood; provides streambed stability and/or habitat complexity, also called coarse woody debris or large woody debris. Large organic debris is large woody debris, but may contain additional non-woody debris, such as animal carcasses.

ECOREGION

A relatively large area of land or water that contains a geographically distinct assemblage of natural communities with similar broad ecological patterns in vegetation, soils, geology, hydrology, landforms and natural disturbances, such as fire.

ENDANGERED SPECIES

Any species of plant or animal defined through the Endangered Species Act of 1973 as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register.

ENDANGERED SPECIES ACT

The federal Endangered Species Act of 1973 (U.S.C. §1531 et seq.), as amended, is the federal statute that establishes processes by which plant and animal species are designated as threatened or endangered. Two federal agencies, the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration-Fisheries Service (the Federal Services), administer this law. Once a species is listed, the act provides that these agencies develop recovery plans for the species, including conserving the ecosystems on which listed species depend. The department's *Habitat Conservation Plan* is an example of such a recovery plan.

ENVIRONMENTAL IMPACT STATEMENT

A document prepared under the National Environmental Policy Act or State Environmental Policy Act to assess the effects that a particular action will have on the environment.

FEN

A peat-accumulating wetland that receives some drainage from surrounding mineral soils and usually supports marshlike vegetation including sedges, rushes, shrubs and trees.

Note: fens are less acidic than bogs and derive most of their water from groundwater rich in calcium and magnesium.

FOREST PRACTICES ACT OF 1974

A Washington State statute (chapter 76.09 RCW) the result of which is comprehensive statewide rules (WAC 222) that establish minimum standards for forest practices on both state and private forestlands, and provides for the necessary administrative procedures and rules applicable to activities conducted on or pertaining to forests on both state-managed and private lands. The act commissioned the Forest Practices Board to promulgate these rules.

FOREST MANAGEMENT UNITS

A forest area designated for management to produce a future stand that will attain a specific set of forest management unit objectives that are consistent with department policy. The boundary of a forest management unit is determined by a variety of factors such as operability limitations as well as bio-physical factors that collectively constitute attributes expressed as forest stands. At the time a forest management unit is defined, it may be a part or all of an existing Forest Resource Inventory System sample unit (forest inventory unit), or it may contain parts of several existing forest inventory units, so long

as the ecological conditions are sufficiently similar to attain the forest management unit's objectives at essentially the same time throughout the forest management unit. A forest management unit is generally identical with the new stand and is the unit of land for which the final silvicultural prescription is developed.

FUEL LOADING

A buildup of forest fuels, especially large expanses of live overstocked stands, and dead and down forest fuels that can generate tremendous thermal outputs during a wildfire, posing a severe problem for firefighters even with high humidities and lower temperature. Under adverse fire weather, high live fuel loading and down dead fuel make for extreme resistance to control. Fuel loading is normally quantified as tons per acre.

GENE POOL

The totality of all alleles of all genes of all individuals in a particular population.

GENE POOL RESERVES

A stand that has been removed from the commercial forest base to conserve native genetic material well-adapted to local conditions for the future.

GREEN-UP

A department trust forest land policy instituted by the Board of Natural Resources that requires even-aged final harvest forest management units to be less than 100 acres and be separated by mature forest buffers at least 300 feet wide, in addition to riparian management zones and their site-specific extensions.

GROUNDWATER

Water that is beneath the land surface. The source of seeps, springs and wells.

HABITAT CONSERVATION PLAN

An implemental program for the long term protection and benefit of a species in a defined area; required as part of a Section 10 incidental taking permit application under the federal Endangered Species Act. The department has a *Habitat Conservation Plan* signed in 1996 in agreement with the United States Fish and Wildlife Service and National Oceanic and Atmospheric Administration-Fisheries. The plan covers approximately 1.6 million acres of state trust lands managed by the department within the range of the northern spotted owl.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION-FISHERIES

The federal agency that is the listing authority for marine mammals, anadromous fish and other marine species under the federal Endangered Species Act.

NATURAL AREA PRESERVES

Under authority of the state Natural Area Preserves Act of 1972 (codified in RCW 79.70), Natural Area Preserves are established on department lands to protect the best remaining examples of many ecological communities, including rare plant and animal habitat. The Natural Area Preserves network represents a legacy for future generations and helps ensure that blueprints of the state's natural ecosystems are protected forever. Areas in the network include five large coastal preserves supporting high quality wetlands, salt marshes, and forested buffers. Other habitats include mounded prairies, sphagnum bogs, natural forest remnants and grassland balds. In size, they range from eight to 3,500 acres. Natural Area Preserves and Natural Resources Conservation Areas are managed by the department under the Natural Heritage Program.

NATURAL RESOURCES CONSERVATION AREAS

Codified in 1987 in RCW 79.71 to protect outstanding examples of native ecosystems; habitat for endangered, threatened and sensitive plants and animals and scenic landscapes. The Natural Resources Conservation Areas Program represents a protection alternative to compliment Natural Area Preserves. Habitats protected in Natural Resources Conservation Areas include coastal and high elevation forests, alpine lakes, wetlands, scenic vistas, nesting birds of prey, rocky headlands and unique plant communities that provide critical habitat for many plant and animal species, including rare species. Natural Resources Conservation Areas also protect geologic, cultural, historic and archeological sites. Twenty-eight sites total approximately 86,550 acres on department-managed lands in Washington. Natural Area Preserves and Natural Resources Conservation Areas are managed by the department under the Natural Heritage Program.

OFFICE OF ARCHAEOLOGICAL AND HISTORIC PRESERVATION

The Washington State Office of Archaeology and Historic Preservation is Washington State's primary agency with knowledge and expertise in historic preservation. The Office of Archaeology and Historic Preservation maintains information on over 20,000 archaeological sites and over 100,000 historic properties.

OMNIBUS ENABLING ACT

The federal statute that in 1889 granted statehood to Washington. The act contains, among other provisions, the granting of specified sections of land to the state to be used for the benefit of all citizens of the state. These lands became, through the state's Constitution and subsequent statutes, the basis for grant lands to be managed in trust for benefit of schools, universities and other public institutions. The Enabling Act also placed limits on the sale, lease and management of these lands.

RIPARIAN MANAGEMENT ZONE

A specified area around streams of Type 1-4 where specific measures are taken to protect the stream and its functions. The riparian management zone consists of the stream, the adjacent riparian buffer and, where appropriate, a wind buffer to protect the integrity of the managed riparian buffer. The riparian buffer has been designed to maintain/restore riparian processes that influence the quality of salmonid habitat and to contribute to the conservation of other aquatic and riparian obligate species. Consideration was given to

water temperature, stream bank integrity, sediment load, detrital nutrient load, and large woody debris. The buffers vary according to stream type, location of the flood plain, windthrow, and stream width.

SALMON RECOVERY FUNDING BOARD

In 1999, the Legislature created the Salmon Recovery Funding Board. Composed of five citizens appointed by the Governor and five state agency directors, the board brings together the experiences and viewpoints of citizens and the major state natural resource agencies. The board provides grant funds to protect or restore salmon habitat and assist related activities. It works closely with local watershed groups known as lead entities. SRFB has helped finance over 500 projects. All meetings are open to the public.

SEED ZONES

A designated area, usually with definite topographic bounds, climate, and growing conditions, containing trees with relatively uniform genetic (racial) composition as determined by progeny testing various seed sources.”

SILVICULTURE

The art and science of cultivating forests to achieve objectives. This concept incorporates theory, planning and practice.

SNAG

A standing dead tree.

STATE ENVIRONMENTAL POLICY ACT (CHAPTER 43.21C RCW)

This law is the basic state statute for protection of the environment. The State Environmental Policy Act requires all state agencies to consider and analyze all significant environmental impacts of any action proposed by those agencies; to inform and involve the public in the agencies’ decision-making processes; and to consider the environmental impacts in the agencies’ decision-making processes.

TRADITIONAL CULTURAL PROPERTIES

Specific geographic areas that are associated with cultural practices or beliefs of a living community that are rooted in that community's history and that are important in maintaining the continuing cultural identity of the community.

TRAX

Total Resource Application Cross-Reference System developed by the department. Information includes timber sales, Application Information and Management System, archaeological-historical sites, Washington State Department of Ecology water rights and Natural Heritage sites.

WATERSHED ADMINISTRATIVE UNIT

The basic hydrologic unit used for watershed analysis. According to WAC 222-22-020, the department, in cooperation with the Washington State Departments of Ecology and Fish and Wildlife, federally-recognized Tribes, local government entities, forest

landowners and the public, defines and maps watershed administrative units throughout the state. Watershed administrative units should be generally between 10,000 to 50,000 acres in size and should be discrete hydrologic units.

WETLANDS

Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions such as swamps, bogs, fens and similar areas.



Appendix I.

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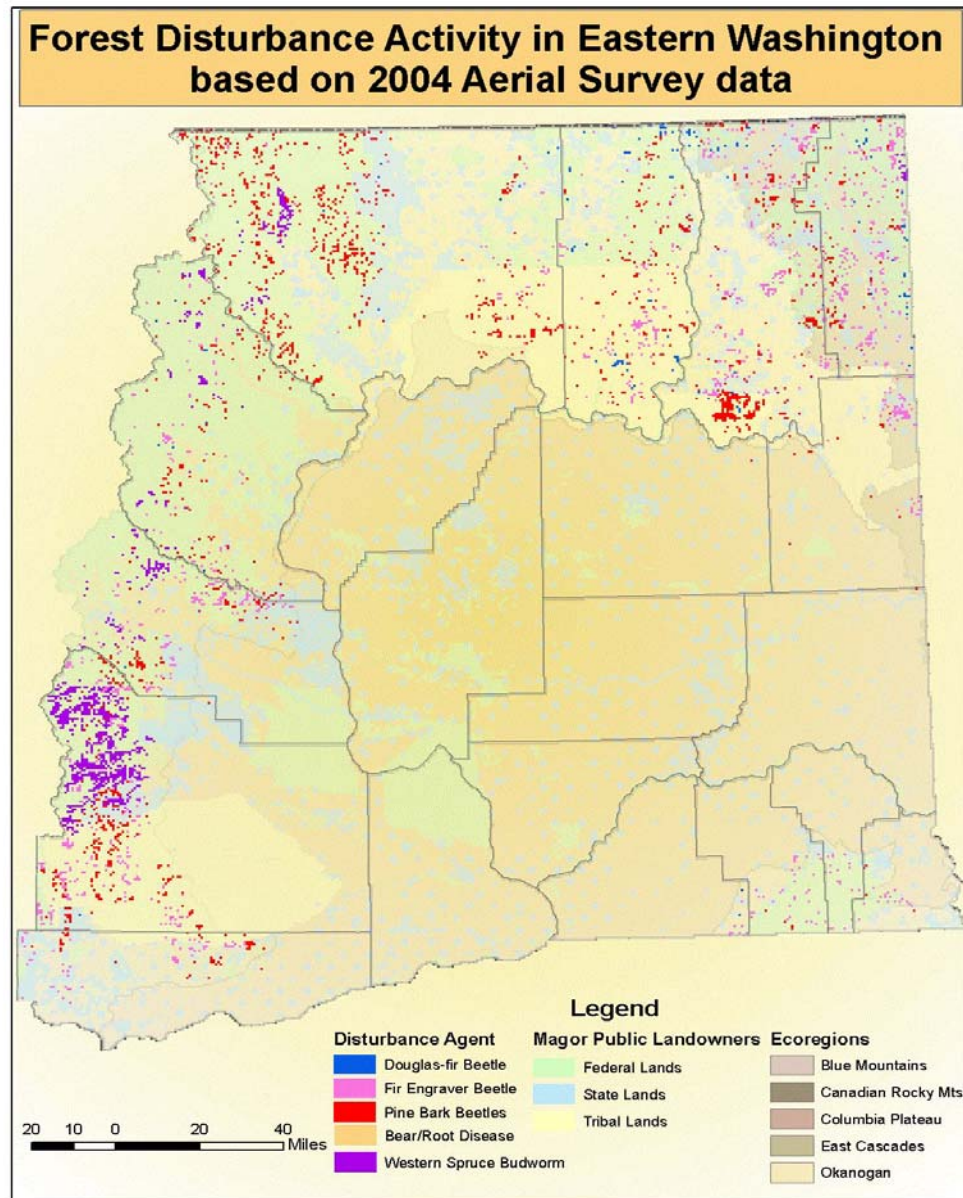
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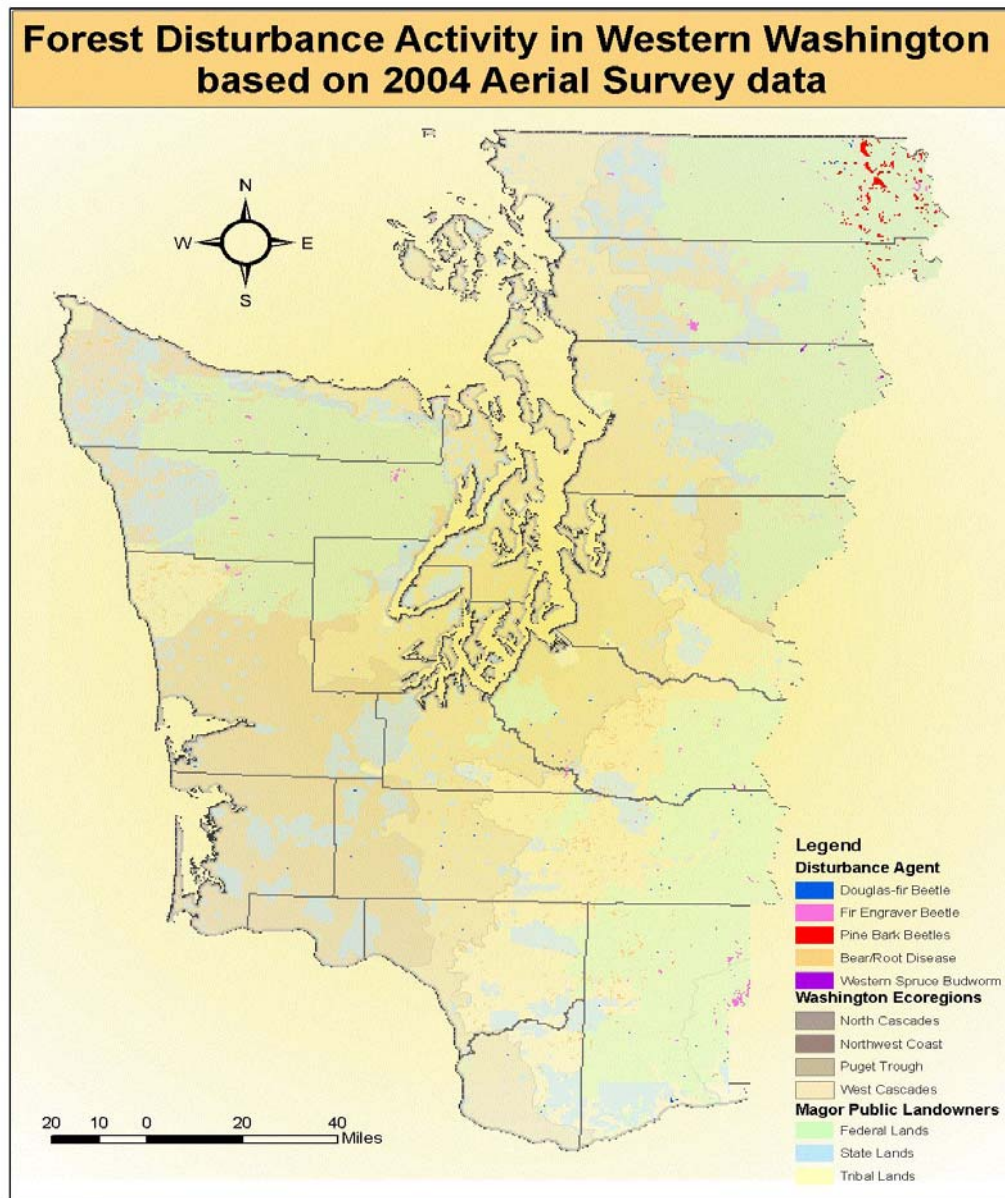
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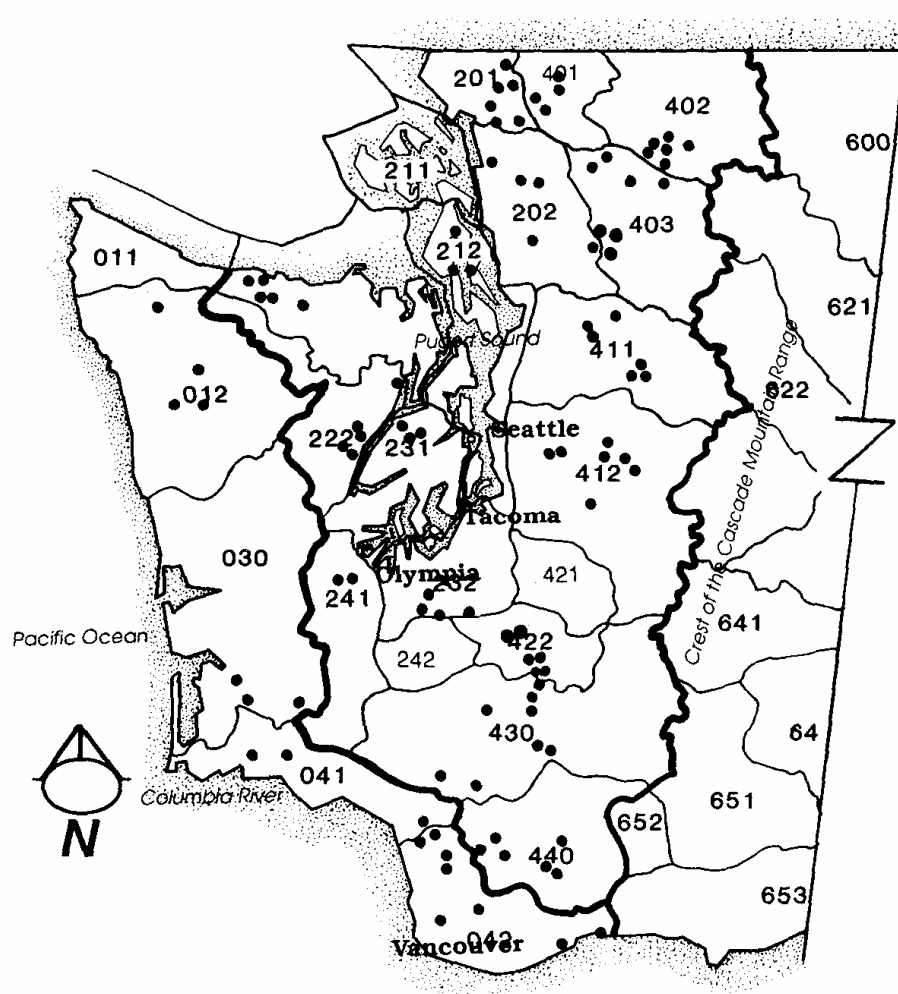
Map 1. Eastern Washington Forest Health



Map 2. Western Washington Forest Health



Map 3. Forest Seed-Zones of Western Washington



NOTE: The dots indicate the locations of Gene Reserves established by the department.



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

PO BOX 47001
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